

Goal 12: Ensure sustainable consumption and production patterns

Target 12.c: Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

**Indicator 12.c.1: Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels**

## Institutional information

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### Organization(s):

UN Environment (United Nations Environment Programme)

## Concepts and definitions

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### Definition:

In order to measure fossil fuel subsidies at the national, regional and global level, three sub-indicators are recommended for reporting on this indicator: 1) direct transfer of government funds; 2) induced transfers (price support); and as an optional sub-indicator 3) tax expenditure, other revenue foregone, and underpricing of goods and services. The definitions of the IEA Statistical Manual (IEA, 2005) and the Agreement on Subsidies and Countervailing Measures (ASCM) under the World Trade Organization (WTO) (WTO, 1994) are used to define fossil fuel subsidies. Standardised descriptions from the United Nations Statistical Office's Central Product Classification should be used to classify individual energy products. It is proposed to drop the wording "as a proportion of total national expenditure on fossil fuels" and thus this indicator is effectively "Amount of fossil fuel subsidies per unit of GDP (production and consumption)".

### Rationale:

The scale and impact of fossil fuel subsidies presents both challenges and opportunities for achieving the goals of the 2030 Agenda on Sustainable Development. For one, the use of fossil fuels, and their promotion through subsidy schemes, adversely affects the ability of governments to attain key goals, such as reducing poverty, improving health, reaching gender equality, providing access to energy, and addressing climate change. At the same time, there is a need to ensure that poor households that are particularly vulnerable to price increases obtain or retain access to energy. Energy-dependent sectors of the economy can be affected, particularly by abrupt changes in prices. Any successful reform therefore requires careful analysis and adapted mitigation measures. For another, reallocating fossil fuel subsidies to sectors that are relevant for development could give a boost to reaching the SDGs.

Awareness and understanding of existing subsidies based on credible data is necessary to increase transparency and inform decision-making. Reporting against a global indicator measuring consumer and producer fossil fuel subsidies provides a global picture that encompasses both consumer and producer subsidies. It allows for tracking of national and global trends and serve as an important guide for policy-making.

### Concepts:

The concepts and definitions used in the methodology have been based on existing international frameworks and glossaries.

- Use definition of fossil fuels from IEA Statistics Manual, “Fossil fuels are taken from natural resources which were formed from biomass in the geological past. By extension, the term fossil is also applied to any secondary fuel manufactured from a fossil fuel.”
- Use the terms set out in CPC Rev. 2.1 for the statistical classification of the individual products. No other commonly accepted definition identified
- Include electricity and heat generated from fossil fuels in the scope of fossil fuels.
- Include non-energy uses with monitoring optional for the measuring of this indicator.
- Additional details are provided in the methodological document entitled, Measuring Fossil Fuel Subsidies in the Context of the Sustainable Development Goals.

#### **Comments and limitations:**

The monitoring and reporting of SDG Indicator 12.c.1 requires capacity within national statistical systems to evaluate direct and indirect transfers of government funds. Data collection by the statistical agencies from the sectoral ministries and state-owned enterprises, including at the sub-national level, which depends on their capacity. There is a need for additional training materials and sharing of experiences on the indicator.

The indicator methodology utilizes a phased monitoring to allow for countries with different capacities to engage in monitoring 12.c.1. The two phases include global monitoring based on price gap estimates plus national monitoring of direct and indirect transfers with optional monitoring of tax expenditure foregone.

## Methodology

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#### **Computation Method:**

It is proposed that countries report on the subsidy categories listed below as sub-indicators.

- Direct transfers;
- Induced transfers (reporting on regulated prices and calculation of the total amount);
- Tax expenditure, other government revenue foregone and under-pricing of goods and services, including risk (optional).

The last category should be included as an optional sub-indicator. Each sub-indicator should be expressed in national currency or United States dollars in current prices. UN Environment will use market exchange rates to calculate between national currency and United States dollar.

Care should be given if a country chooses to aggregate across the three sub-indicators in order to avoid double counting and all three sub-indicators should be publicly available to ensure transparency. Care needs to be taken when aggregating estimates of induced transfers with data on direct transfers and some measures in under-pricing of goods and services.

Estimates of subsidies to consumers observable through price-gaps (i.e., consumer price support) have been calculated by several international organizations (IADB, IEA, and IMF), covering different geographic regions and time-periods. The three organisations that produce these estimates use roughly the same approach, which can be summed up by the following equation:

Consumer price support = (adjusted net-of-tax reference unit price – local net-of-tax unit price) x units subsidized

Estimates are based on reference prices on import (or export) parity prices using the price of a product at the nearest international hub, adjusted for quality differences if necessary, plus (or minus) the cost of freight and insurance to the net importer (or back to the net exporter), plus the cost of internal distribution and marketing and any value-added tax (VAT). For tradable commodities (mainly coal, crude oil, and petroleum products), the reference prices are based on the spot price at the nearest international hub – e.g., the United States, Northwest Europe, or Singapore.

**Disaggregation:**

Because of the risk of double counting, the dataset should therefore provide disaggregated information on individual subsidy measures that will be reported as sub-indicators by category of subsidies.

**Treatment of missing values:**

- [At country level](#)

Missing values are not imputed.

- [At regional and global levels](#)

A price gap method is used to create national, regional and global estimates.

**Regional aggregates:**

The methodology used for the calculation of the regional/global aggregates from the country values is available at [http://pre-uneplive.unep.org/media/docs/graphs/aggregation\\_methods.pdf](http://pre-uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf).

**Sources of discrepancies:**

Country level data and price gap data are shown separately, thus this should not apply.

## Data Sources

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**Description:**

Direct transfers are generally reported in government budgets, and well documented in sectoral and Finance Ministries, broken down by programme if not by fuel. Those that meet the SNA definition of “subsidies” – i.e., subsidies on products, and other subsidies on production – can also be found in a country’s System of National Accounts. Budget documents are publicly available for most countries. The degree to which information on individual programmes is itemized in those reports is highly variable, however. Support to corporations involved in energy production or transformation may sometimes be found in their annual reports, for example. In some cases, researchers may be able to obtain unpublished data from state-owned energy enterprises directly.

Induced transfer are measured by calculating the price-gap between the producer or consumer price and a reference price, and multiplying that differential by the affected volume produced or consumed.

Measuring the value of special features introduced into the tax code to favour certain industries or activities of those industries (such as investment in productive capital) can be a complex endeavour. Some countries do this exercise already, and report the annual value of those tax features in their periodic tax-expenditure reports. Where that is not the case, the analyst must construct a model and

estimate the difference in the revenues that would be owed to the government under the baseline conditions and with the special tax feature.

Fossil fuel subsidies should be monitored on an annual basis.

**Collection process:**

The data will be collected by UN Environment through electronic reporting being developed by UN Environment.

## Data Availability

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**Description:**

An initial baseline data assessment of data availability demonstrates that 99 countries have existing data which can be used to estimate fossil fuels from direct transfer and many of these countries also have information on tax revenue foregone. Data on induced transfers using a price gap approach is available for all UN member states.

**Time series:**

The reporting on this indicator will follow an annual cycle with initial reporting on induced transfers starting in 2018. Data on direct transfers and tax revenue foregone will be in place by 2020.

## Calendar

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**Data collection:**

Annual with reporting on induced transfers starting in 2018. Data on direct transfers and tax revenue foregone will be in place by 2020.

**Data release:**

Annual.

## Data providers

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1. National Focal Points from National Statistical Systems.
2. OECD
3. IMF and IEA

## Data compilers

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UN Environment (United Nations Environment Programme)

## References

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**References:**

IEA. (2005). *Energy Statistics–Manual. International Energy Agency, Paris, France*. Paris. <https://doi.org/10.1787/9789264033986-en>

OECD. (2015). *OECD Companion to the Inventory of Support Measures for Fossil Fuels 2015*. Paris.

## Related indicators

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Goal 12: Ensure sustainable consumption and production patterns

Target 12.1: Implement the 10-Year Framework of Programs on sustainable consumption and production (10YFP), all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

Indicator 12.1.1: Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies

## Institutional information

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### Organization(s):

United Nations Environment Programme (UNEP)

## Concepts and definitions

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### Definition:

This indicator allows for the quantification (#) and monitoring of countries making progress along the policy cycle of binding and non-binding policy instruments aimed at supporting Sustainable Consumption and Production.

- **Sustainable Consumption and Production:** the working definition of Sustainable Consumption and Production (SCP) used in the context of this framework is: “The use of services and related products, which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generation.”<sup>1</sup>
- **Policy:** although quite flexible and contexts specific, a policy is usually defined as a course of action that has been officially agreed by an entity or an organization (governmental or non-governmental) and is effectively implemented to achieve specific objectives.
- **Policy instruments for sustainable consumption and production:** policy instruments refer to the means – methodologies, measures or interventions – that are used to achieve those objectives. In the case of SCP, such instruments are designed and implemented to reduce the environmental impacts of consumption and production patterns, with a view of generating economic and/or social benefits.

Making progress along the policy cycle refers to the development, adoption, implementation or evaluation of such policy instruments.

### Rationale:

Mainstreaming sustainable consumption and production in decision-making at all levels is a core function of the 10-Year Framework, which is expected to “*support the integration of sustainable consumption and production into sustainable development policies, programmes and strategies, as appropriate, including, where applicable, into poverty reduction strategies*” (Rio+20 Outcome Document – A/CONF.216/5). The purpose of this indicator is to help assess the volume and geographical repartition of governments progressing on sustainable consumption and production. In addition, further information is being collected on the types, focus and orientation of the policy instruments that are being developed and used, to monitor

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<sup>1</sup> UNEP (2010). *ABC of SCP: Clarifying Concepts on Sustainable Consumption and Production*.

their progression over time as well as their contribution to other Sustainable Development Goals. This should support evaluation of how much / how fast governments progress in the development and application of policies addressing sustainable consumption and production, whether at cross-cutting or sectoral level.

The indicator is also considering both binding (laws and regulations) and non-binding policy instruments. The first category is essential to the shift, as binding instruments provide the legal ground for sustainable consumption and production, and can be used for enforcement or to provide incentives. The ability to develop, pass and implement legislation is an indication of jurisdictions' engagement in the shift towards sustainable consumption and production. This indicator can also help monitor the evolution of the global legislative landscape. The second category is also essential to ensure institutional engagement, commitment and ownership. In some cases, non-binding policy instruments can lead to the creation of new legal ones. The development and implementation of non-binding instruments across sectors also provides information on engagement of partners and other stakeholders in sustainable consumption and production.

### Concepts:

As mentioned above, policy instruments are distinguished in legally binding policies and non-legally binding ones.

- **Legally binding:** a legally binding policy instrument refers to a system of rules, procedures and/or principles which are prescribed and enforced by a governing authority with the aim of requiring or preventing specific actions or providing incentives that lead to change in actions or preferences. It includes: laws, regulations, standards, by-laws, codes, etc. They can relate to different types of jurisdictions such as a ministry, state, municipality, or group of states.
- **Non-binding:** a non-binding policy instrument refers to a coherent set of decisions associated to a common vision, objective and/or direction, and to a proposed course of action to achieve these. It includes, for instance: action plans, policies, strategies, programmes, and projects. They can have different scopes of application (international, national, local, etc.).
- At another level, different categories of policy instruments can be distinguished:
  - Macro policies (e.g. national strategies/action plans, new institutions/entities)
  - Regulatory and legal instruments (e.g. laws, standards, enforcement measures)
  - Economic and fiscal instruments (taxes and tax incentives, grants, preferential loans, etc.)
  - Voluntary and self-regulation schemes (e.g. sectoral partnerships, codes of conduct, CSR initiatives)

It is important to note that, except for regulatory / legal instruments and voluntary / self-regulation schemes, the options above are not mutually exclusive: for instance, an economic instrument can be legally binding.

**“Policy cycle”:** this political science concept is widely used to analyse and inform public policy-making processes, but can be transposed to any recurrent pattern leading to the implementation of a policy or policy instrument. The following approach with regards to the various stages of the policy cycle is adopted:

- Policy development, including Agenda setting (e.g. the problem identified is high enough on the public agenda that action becomes likely) and Policy design (e.g. setting objectives, identifying costs-benefits of potential policy instruments and selecting);
- Policy adopted or officially launched (e.g. adopting or authorizing the preferred policy options through the legislative process and refined through the bureaucratic process);

- Policy under implementation through specific actions (e.g. translating policy into concrete action and policy instruments); results and impacts are being monitored;
- Policy and related action plan has reached its end date and has been evaluated.

**Comments and limitations:**

Whereas the indicator quantifies and monitors countries' progress along the policy cycle of binding and non-binding policy instruments aimed at supporting Sustainable Consumption and Production; it does not provide any qualitative information and whether policies were well-designed or if a proper background analysis had been conducted, the quality of implementation, level of enforcement, and its effects. These aspects will have to be looked at through narrative reports / qualitative analysis.

The indicator encompasses policy instruments supporting the shift to SCP, including: policies which identify SCP as a key priority, policies focused on SCP and sectoral policies with SCP objectives. It is acknowledged that sectoral policies are also being reported under other SDG indicators and in particular 12.7.1 (# of countries implementing sustainable public procurement policies and action plans) and 12.b.1 (# of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools).

Establishing baselines and targets can be time and resource intensive and depends on the willingness of 10YFP National Focal Points to communicate necessary information.

Main aspects regarding precision, reliability, attribution and double counting are addressed above. If you come across additional issues, please inform the 10YFP Secretariat.

## Methodology

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**Computation Method:**

To be reported under this indicator, a government should have moved through one or more new stage(s) of the "Policy cycle" on one or more policy instrument(s) during the reporting period.

This indicator is calculated at relevant aggregation levels based on the information collected from the National Focal Points and other government officials; users of the data should be mindful of double counting one same policy, when aggregating data across reporting years.

**Disaggregation:**

- Country (using the official SDG country list provided by UNDESA).
- Ministry: Ministry of Environment / Sustainable Development / Natural Resources / Energy; Ministry of the Economy / Finance / Treasury; Ministry of Industry / Trade / Commerce / Labour; Ministry of Planning / Development / Infrastructures; Ministry of Foreign Affairs / Regional / International Cooperation; Ministry of Energy / Mineral Development / Power; Ministry of Science / Research / Technology / Innovation; Ministry of Agriculture / Livestock / Fisheries / Forestry / Food Security / Rural Affairs; Ministry of Tourism / Culture / Sports; Ministry of Transports / Roads / Works / Construction / Building; Ministry of Urban Development / Land Management / Housing; Ministry of Education / Higher Education / Youth; Ministry of Poverty Alleviation / Social Welfare / Families / Women.
- Policy: macro-policy; policy instrument.
- Type of macro-policy: macro-policy specifically focused on SCP; macro-policy with SCP as a key priority/objective; sectoral macro-policy with SCP objectives.

- Focus of “macro-policy with SCP as a key priority/objective”: sustainable development; green economy/green growth; circular economy; development/poverty eradication; other (specified).
- Type of instrument: regulatory/legal; economic/financial; voluntary/self-regulatory
- Policy cycle stage: Under development (initial stage); just adopted; under implementation through specific actions; has reached its end date and has been evaluated.
- Year of adoption: 2002 to 2022.
- Legal status: binding/non-binding.
- Sectors: Agriculture and fishery; Buildings and construction; Consumer goods; Culture and recreation; Financial sector; Education; Energy, Food & Beverage; Forestry; Environmental protection; Environmental services; Government and Civil Society; Housing; Industrial sector (Including SMEs); Scientific Research, Development and Innovation; Tourism; Transport; Waste (including Chemicals); Water.
- Actors involved: national ministries or other specialized national agencies; local authorities; civil society organizations; scientific and technical organizations; United Nations/inter-governmental organizations; business sector.
- Support received from non – national partner: United Nations/inter-governmental organizations; multilateral financial institutions; bilateral organizations; international non-governmental organizations.
- Support received from 10YFP: encouraged the development/implementation; technical support; financial support; capacity-building activities; experience and knowledge-sharing tools; no connection to 10YFP.
- Support received from 10YFP programmes: sustainable public procurement; sustainable tourism; consumer information for SCP; sustainable food systems; sustainable lifestyles and education; sustainable buildings and construction; none of the above.
- Link to other SDGs: SDG 1;2;3;4;5;6;7;8;9;10;11;13;14;15;16;17
- Impact measured: Resource efficiency; environmental impact; human well-being. More detailed impact indicators in the 10YFP Indicators of Success.
- Relevant links and attachments including electronic copies of the policies, or their drafts, relevant official reports, summary of consultations and any other relevant associated documents and web links should be attached to the reporting.

#### **Treatment of missing values:**

- [At country level](#)

A zero is imputed when no positive real value was officially recorded, in the base data sets used, for any of the underlying components which make up this aggregated total. Thus “0.0” can represent either NA, or a genuine 0.0, or (crucially) a combination of both, which is a common situation. This allows for values to be easily aggregated into further aggregations; however, it should be thus noted that due to imputing missing values as ‘0.0’, the aggregations may represent a lower value than actual situation.

- [At regional and global levels](#)

Similarly, missing values are imputed as zero in the regional and global aggregations.

Note: the disaggregation categories above are indicative and some can be left empty when reporting on measures for which such data elements are not available.

## **Data Sources**

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**Description:**

- Data is collected through an online survey based on this metadata sheet.
- The survey may include additional questions, such as those on inter-ministerial and/or multi-stakeholder coordination mechanism for SCP.
- The questions included in the survey can be revised as needed, in particular as data becomes available through the survey and alignment may be required with related ongoing work under the SDGs.
- The 10YFP Global Survey on National SCP Policies and Initiatives, administered by the 10YFP Secretariat in 2015, and reported on by 10YFP National Focal Points, as well as the subsequent report, may complement information and data collected.

**Collection process:**

- Data is provided by 10YFP National Focal Points.
- The survey is administered by the 10YFP Secretariat.
- A pilot data collection and reporting was undertaken to test the methodology and reporting tools in 2017. On the basis of this pilot the methodology may be further revised.
- The 10YFP or 10YFP secretariat is not responsible for the quality of the data provided.

## Data Availability

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**Description:**

To date, 71 countries plus the European Union have participated in the pilot reporting on SDG 12.1.1. In addition, the data collected through the 2015 prototype survey and subsequent report bring to 82 the number of countries where policy instruments supporting the shift to sustainable consumption and production have been developed / reported.

**Time series:**

The data set covers each nation individually since 2002.

## Calendar

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**Data collection:**

- Reporting on this indicator should be done in accordance with the methodology presented here.
- 10YFP National Focal Points are responsible for relevance, accuracy and methodological rigour of any information reported.
- The pilot reporting and data collection scheduled for Q4 of 2017; related data release is scheduled for Q2 2018.
- It is envisaged that the data is collected every 2 years.

**Data release:**

First release of data at the High Level Political Forum on Sustainable Development in 2018.

## Data providers

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National data provider: 10YFP National Focal Points – the full list of National Focal Points is available here. In countries there is no nominated 10YFP national focal point, the survey will be sent to the UN Environment Focal Point.

## Data compilers

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Organisations responsible for data collection and compilation on this indicator at the global level: UN Environment, the 10YFP Secretariat administers the data collection through a dedicated online tool. UN Environment, the 10YFP or the 10YFP Secretariat are not responsible for the quality of the data provided.

## References

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### URL:

- 10YFP Indicators of Success: principles, process and methodology, January 2017
- UNEP Live (Natural Resources: DMC, Energy, GHG, Water Footprint) <http://uneplive.unep.org>
- Capacity-building and policy needs assessment for SCP developed by SWITCH Asia <http://www.switch-asia.eu/policy-support-components/rpsc/policy-assessment>

### References:

- Sustainable Consumption and Production: A handbook for policy-makers. UNEP, 2015.
- ABC for SCP: clarifying concepts on Sustainable Consumption and Production, UNEP, 2010
- 10YFP Secretariat's inventory of SCP National Action Plans and other strategies integrating SCP
- Methodological note and questionnaire of the 10YFP Global Survey on National SCP Policies and Initiatives
- Global Outlook on SCP, UNEP, 2011
- Sustainable Consumption and Production indicators for the future SDGs. UNEP, 2015

## Related indicators

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The 10-year framework of programmes on Sustainable Consumption and Production is linked to all targets of SDG 12, literature research shows that SDG 12 is connected to a total of 14 other SDGs - making SCP the number one most cross-cutting theme across the SDGs.

Main Associated SDG indicators:

12.7.1 # of countries implementing sustainable public procurement policies and action plans;

12.b.1 # of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools

Linked SDGs: 12.2.1/8.4.1, 12.2.2/8.4.2, 12.3.1, 12.5.1., 12.6.1, 12.8.1, 13.2.1, 14.c.1, 14.6.1,15.8.1

Considering that the development, adoption and implementation of policy instruments integrating SCP are creating the enabling environment for sustainable development, there are potentially many more associated SDGs, targets and indicators.

Goal 12: Ensure sustainable consumption and production patterns

Target 12.2: By 2020, achieve the sustainable management and efficient use of natural resources.

Indicator 12.2.1: Material Footprint, material footprint per capita, and material footprint per GDP

## Institutional information

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**Organization(s):**

United Nations Environment Programme (UNEP)

## Concepts and definitions

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**Definition:**

Material Footprint (MF) is the attribution of global material extraction to domestic final demand of a country. The total material footprint is the sum of the material footprint for biomass, fossil fuels, metal ores and non-metal ores.

**Rationale:**

Material footprint of consumption reports the amount of primary materials required to serve final demand of a country and can be interpreted as an indicator for the material standard of living/level of capitalization of an economy. Per-capita MF describes the average material use for final demand.

**Concepts:**

Domestic Material Consumption (DMC) and MF need to be looked at in combination as they cover the two aspects of the economy, production and consumption. The DMC reports the actual amount of material in an economy, MF the virtual amount required across the whole supply chain to service final demand. A country can, for instance have a very high DMC because it has a large primary production sector for export or a very low DMC because it has outsourced most of the material intensive industrial process to other countries. The material footprint corrects for both phenomena.

**Comments and limitations:**

The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world.

## Methodology

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**Computation Method:**

It is calculated as raw material equivalent of imports ( $RME_{IM}$ ) plus domestic extraction (DE) minus raw material equivalents of exports ( $RME_{EX}$ ). For the attribution of the primary material needs of final demand a global, multi-regional input-output (MRIO) framework is employed. The attribution method based on I-O analytical tools is described in detail in Wiedmann et al. 2015. It is based on the EORA MRIO framework developed by the University of Sydney, Australia (Lenzen et al. 2013) which is an internationally well-established and the most detailed and reliable MRIO framework available to date.

**Disaggregation:**

The MF indicator can be disaggregated to four main material categories, a varying number of economic sectors whose expenditure require materials and to three domestic final demand sectors (household consumption, government consumption and capital investment) and foreign final demand (i.e. exports).

#### **Treatment of missing values:**

- [At country level](#)

A zero is imputed when no positive real value was officially recorded, in the base data sets used, for any of the underlying components which make up this aggregated total. Thus “0.0” can represent either NA, or a genuine 0.0, or (crucially) a combination of both, which is a common situation. This allows for values to be easily aggregated into further aggregations; however, it should be thus noted that due to imputing missing values as ‘0.0’, the aggregations may represent a lower value than actual situation.

- [At regional and global levels](#)

Similarly, missing values are imputed as zero in the regional and global aggregations. However, in the case where no data is available at all for a particular country then the per capita and per GDP estimates are weighted averages of the available data.

#### **Regional aggregates:**

See: [http://uneplive.unep.org/media/docs/graphs/aggregation\\_methods.pdf](http://uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf)

#### **Sources of discrepancies:**

## Data Sources

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#### **Description:**

The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world. Estimated data is produced on the bases of data available from different national or international datasets in the domain of agriculture, forestry, fisheries, mining and energy statistics. International statistical sources for DMC and MF include the IEA, USGS, FAO and COMTRADE databases.

#### **Collection process:**

The IRP Global Material Flows and Resource Productivity working group compiles the data from countries and from other sources.

## Data Availability

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#### **Description:**

The data covers more than 170 countries.

**Time series:**

The data set covers each nation individually, over a time period of 40 years (1970-2010).

## Calendar

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**Data collection:**

Under discussion

**Data release:**

## Data providers

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National Statistical Offices

## Data compilers

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UNEP, OECD and EUROSTAT

## References

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**URL:****References:**

EUROSTAT (2013). Economy-wide material flow accounts. Compilation guide 2013.

Wiedmann, T., H. Schandl, M. Lenzen, D. Moran, S. Suh, J. West, K. Kanemoto, (2013) The Material Footprint of Nations, Proc. Nat. Acad. Sci. Online before print.

Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. (2013) Building Eora: A global Multi-regional Input-Output Database at High Country and Sector Resolution, Economic Systems Research, 25:1, 20-49.

## Related indicators

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Target 8.4

Goal 12: Ensure sustainable consumption and production patterns

Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

Indicator 12.2.2: Domestic material consumption (DMC) and DMC per capita, per GDP

## Institutional information

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**Organization(s):**

United Nations Environment Programme (UNEP)

## Concepts and definitions

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**Definition:**

Domestic Material Consumption (DMC) is a standard material flow accounting (MFA) indicator and reports the apparent consumption of materials in a national economy.

**Rationale:**

DMC reports the amount of materials that are used in a national economy. DMC is a territorial (production side) indicator. DMC also presents the amount of material that needs to be handled within an economy, which is either added to material stocks of buildings and transport infrastructure or used to fuel the economy as material throughput. DMC describes the physical dimension of economic processes and interactions. It can also be interpreted as long-term waste equivalent. Per-capita DMC describes the average level of material use in an economy – an environmental pressure indicator – and is also referred to as metabolic profile.

**Concepts:**

Domestic Material Consumption (DMC) and MF need to be looked at in combination as they cover the two aspects of the economy, production and consumption. The DMC reports the actual amount of material in an economy, MF the virtual amount required across the whole supply chain to service final demand. A country can, for instance have a very high DMC because it has a large primary production sector for export or a very low DMC because it has outsourced most of the material intensive industrial process to other countries. The material footprint corrects for both phenomena.

**Comments and limitations:**

DMC cannot be disaggregated to economic sectors which limits its potential to become a satellite account to the System of National Accounts (SNA).

## Methodology

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**Computation Method:**

It is calculated as direct imports (IM) of material plus domestic extraction (DE) of materials minus direct exports (EX) of materials measured in metric tonnes. DMC measure the amount of materials that are used in economic processes. It does not include materials that are mobilized the process of domestic extraction but do not enter the economic process. DMC is based on official economic statistics and it requires some modelling to adapt the source data to the methodological requirements of the MFA. The

accounting standard and accounting methods are set out in the EUROSTAT guidebooks for MFA accounts in the latest edition of 2013. MFA accounting is also part of the central framework of the System of integrated Environmental-Economic Accounts (SEEA).

**Disaggregation:**

The DMC indicator can be disaggregated into imports, domestic extraction and exports by a large number of material flow categories. At the highest level of aggregation biomass, fossil fuels, metal ores and non-metallic minerals are distinguished. DMC is usually reported for 11 material categories, DE for 44 material categories.

**Treatment of missing values:**

- [At country level](#)

A zero is imputed when no positive real value was officially recorded, in the base data sets used, for any of the underlying components which make up this aggregated total. Thus “0.0” can represent either NA, or a genuine 0.0, or (crucially) a combination of both, which is a common situation. This allows for values to be easily aggregated into further aggregations; however, it should be thus noted that due to imputing missing values as ‘0.0’, the aggregations may represent a lower value than actual situation.

- [At regional and global levels](#)

Similarly, missing values are imputed as zero in the regional and global aggregations. However, in the case where no data is available at all for a particular country then the per capita and per GDP estimates are weighted averages of the available data.

**Regional aggregates:**

See: [http://uneplive.unep.org/media/docs/graphs/aggregation\\_methods.pdf](http://uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf)

**Sources of discrepancies:**

## Data Sources

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**Description:**

The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world. Estimated data is produced on the bases of data available from different national or international datasets in the domain of agriculture, forestry, fisheries, mining and energy statistics. International statistical sources for DMC and MF include the IEA, USGS, FAO and COMTRADE databases.

**Collection process:**

The IRP Global Material Flows and Resource Productivity working group compiles the data from countries and from other sources.

## Data Availability

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**Description:**

The data covers more than 170 countries.

**Time series:**

The data set covers each nation individually, over a time period of 40 years (1970-2010).

## Calendar

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**Data collection:**

Under discussion

**Data release:**

## Data providers

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National Statistical Offices

## Data compilers

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UNEP, OECD and EUROSTAT

## References

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**URL:****References:**

EUROSTAT (2013). Economy-wide material flow accounts. Compilation guide 2013.

Wiedmann, T., H. Schandl, M. Lenzen, D. Moran, S. Suh, J. West, K. Kanemoto, (2013) The Material Footprint of Nations, Proc. Nat. Acad. Sci. Online before print.

Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. (2013) Building Eora: A global Multi-regional Input-Output Database at High Country and Sector Resolution, Economic Systems Research, 25:1, 20-49.

## Related indicators

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Target 8.4

Goal 12: Ensure sustainable consumption and production patterns

Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

Indicator: 12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

## Institutional information

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**Organization(s):**

UN Environment (United Nations Environment Programme)

## Concepts and definitions

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**Definition:**

The indicator refers to the number of parties (=countries that have ratified, accepted, approved or accessed), to the following Multilateral Environmental Agreements (MEAs):

1. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention);
2. The Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade (Rotterdam Convention);
3. The Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention);
4. The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol);
5. Minamata Convention on Mercury (Minamata Convention),

Which have submitted the information to the Secretariat of each MEA, as required by each of the agreements.

The information required is as follows:

**Basel Convention<sup>1</sup>:**

1. Designation of the Focal Point and one or more Competent Authorities;
2. Submission of the annual national reports.

**Rotterdam Convention:**

1. Designation of the Designated National Authority(-ies) and Official contact points;

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<sup>1</sup> The parameters presented below are based on the obligations of the Parties to transmit information to the Secretariat, whatever its national circumstances. Other information that only needs to be communicated to the Secretariat based on national circumstances, such as a possible national definitions of hazardous wastes, possible article 11 agreements under the Basel Convention, or a possible exemptions under the Stockholm Convention would not be included, either because the Secretariat is not in a position to assess whether the obligation to transmit information has materialized itself, or because Parties have the right not to make use of a right.

2. Submission of the import responses.

**Stockholm Convention:**

1. Designation of the Stockholm Convention official contact points and national focal points;
2. Submission of the national implementation plans;
3. Submission of the revised national implementation plan addressing amendments;
4. Submission of the national reports.

**Montreal Protocol:**

1. Compliance with reporting requirements for production and consumption of ozone-depleting substances under (Article 7 of) the Montreal Protocol;
2. Submission of information on Licensing systems under (Article 4B of) the Montreal Protocol.

**Minamata Convention:**

1. Designation of a national focal point for exchange of information under Article 17 of the Convention;
2. Submission of national reports as required under Article 21 of the Minamata Convention.

**Rationale:**

The proposed indicator is process-oriented, focusing on compliance with the obligations that contribute to the overall target of achieving the environmentally sound management of chemicals and all wastes throughout their life cycle.

It doesn't measure the quantity of chemicals in media and doesn't quantify adverse impacts on human health and the environment. The MEAs, however, were developed and adopted to address the most urgent challenges for human health and the environment and therefore, through the implementation of MEAs progress will be made to reduce release to air, water and soil and well as presence of hazardous chemicals in products.

**Concepts:**

Parties: countries that have ratified, accepted, approved or accessed a convention.

Information: Parties to the Basel Convention have an obligation to present an annual national report as provided for by Article 13, paragraph 3 in order to enable monitoring of the implementation of the Basel Convention by its Parties. The reports are to contain, inter alia, Information regarding transboundary movements of hazardous wastes or other wastes in which Parties have been involved, including the amount of hazardous wastes and other wastes exported, their category, characteristics, destination, any transit country and disposal method as stated on the response to notification, the amount of hazardous wastes and other wastes imported their category, characteristics, origin, and disposal methods; information on accidents occurring during the transboundary movement and disposal of hazardous wastes and other wastes and on the measures undertaken to deal with them; information on disposal options operated within the area of their national jurisdiction; and other information as per reporting format.

Import responses under the Rotterdam Convention are the decisions provided by Parties indicating whether or not they will consent to import the chemicals listed in Annex III of the Convention and subject to the prior informed consent (PIC) procedure. Article 10 of the Rotterdam Convention sets out the obligations of Parties with respect to the future import of chemicals listed in Annex III.

Under the Stockholm Convention a Party has an obligation to report on the measures it has taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention. The national reports include statistical data on the total quantities of production, import and export of each of the chemicals listed in Annex A and Annex B or a reasonable estimate of such data; and to the extent practicable, a list of the States from which it has imported each such substance and the States to which it has exported each such substance. A National Implementation Plan under the Stockholm Convention is a plan explaining how a Party is going to implement the obligations under the Convention and make efforts to put such a plan into operation (Article 7). Changes in the obligations arising from amendments to the Convention or its annexes, for example when a new chemical is listed into the annexes of the Convention, a Party will review and update its implementation plan, and transmit the updated plan to the Conference of the Parties within two years of the entry into force of the amendment for it, consistent with paragraph 1 (b) of the Convention (according to paragraph 7 of the annex to decision SC-1/12).

**Comments and limitations:**

The transmission of information as required by the five Conventions follows a different timing. This is the reason why the reporting to this indicator has been scheduled for 5-year cycles, which would allow capturing the compliance of Parties with the transmission of information of all the Conventions.

Please also note that the timing for submission of reporting for the Minamata Convention has not yet been agreed on. It is not clear whether any reporting will be required prior to 2020, nor it is clear how many times reporting would be required prior to 2030. Thus, the Minamata Convention is included here, but the reporting is subject to further decisions on this.

## Methodology

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**Computation Method:**

In the following methodology, reporting is to take place in 2017 for the period 2010-2014, in 2020 for the period 2015-2019, in 2025 for the period 2020-2024 and in 2030 for the period 2025-2029. Reporting parameters include the following:

The Country Score depends on the amount of information that is sent to the Conventions' Secretariat, and is calculated as follows (and communicated by the Secretariats):

**Basel Convention:**

1. Designation of the Focal Point and one or more Competent Authorities (1 point);
2. Submission of the annual national reports during the reporting period (1 point per report).

**Rotterdam Convention:**

1. Designation of the Designated National Authority(-ies) and Official contact point (1 point);
2. Submission of the import responses during the reporting period (0,2 point per import response).

**Stockholm Convention:**

1. Designation of the Stockholm Convention official contact point and national focal point (1 points);

2. Submission of the national implementation plan (1 points);
3. Submission of the revised national implementation plan(s) addressing the amendments adopted by the Conference of the Parties within the reporting period (1 point per revised and updated plan)<sup>2</sup>;

#### **Montreal Protocol:**

1. Compliance with reporting requirements for production and consumption of ozone-depleting substances under (Article 7 of) the Montreal Protocol (15 points);
2. Submission of information on Licensing systems under (Article 4B of) the Montreal Protocol (5 points).

#### **Minamata Convention<sup>3</sup>:**

1. Designation of a national focal point (Article 17) (5 points);
2. Submission of national report (Article 21) (15 points).

	<b>Convention</b>	<b>Available Points (ap)</b>	<b>Points per year [p(t)]</b>	<b>Country Score (cs)</b>
a	Basel Convention			$[p(t1)]+[p(t2)]+[p(t3)]+[p(t4)]+[p(t5)]/ap$
b	Rotterdam Convention			
c	Stockholm Convention			
d	Montreal Protocol			
e	Minamata Convention			

$$Transmission\ Rate = \frac{(a_{cs} + b_{cs} + c_{cs} + d_{cs} + e_{cs})}{N.\ of\ Conventions} * 100$$

The final indicator will be a number expressed as percent, where 100% is the maximum degree of compliance with the reporting obligations of the MEAs to which a Country is a Party, and 0% the least degree of compliance with those obligations.

#### **Disaggregation:**

The indicator is available at country level.

It is disaggregated by Convention, in addition to providing the average transmission rate of the five Conventions.

#### **Treatment of missing values:**

- [At country level](#)

Missing values are not imputed.

- [At regional and global levels](#)

Missing values are not imputed.

<sup>2</sup> Applicable to Parties bound by the amendments to the Stockholm Convention. Parties that are not bound by the amendments will by default receive one point for each such amendment.

<sup>3</sup> Please note that at the moment data is not available for the Minamata Convention. The timing of submission of reporting is not yet decided.

**Regional aggregates:**

For the aggregation methods, please see:

[http://pre-uneplive.unep.org/media/docs/graphs/aggregation\\_methods.pdf](http://pre-uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf).

**Sources of discrepancies:**

## Data Sources

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**Description:**

1. Basel Convention: national focal points, electronic reporting system for annual national reports;
2. Rotterdam Convention: official contact points, PIC circular for import responses;
3. Stockholm Convention: official contact points; electronic reporting system for national reports every four years, National Implementation Plans;
4. Montreal Protocol: national focal points;
5. Minamata Convention: national focal points.

**Collection process:**

Data is collected by the Secretariat of the Basel, Rotterdam and Stockholm Conventions from Focal Points for the Basel Conventions, Official contact points for the Rotterdam Convention, official contact points for the Stockholm Convention, by the Ozone Secretariat from national focal points for the Montreal Protocol, and by the Secretariat of the Minamata Convention from national focal points for the Minamata Convention.

## Data Availability

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**Description:**

1. Basel Conventions: 185 Parties;
2. Rotterdam Convention: 180 Parties;
3. Stockholm Convention: 156 Parties;
4. Focal points for Montreal Protocol: 197 Parties;
5. Minamata Convention: currently 35 Parties.

**Time series:**

The reporting on this indicator will follow a 5-year cycle.

1. First baseline reporting cycle in 2017: data collected from 2010 to 2014;
2. Second reporting cycle in 2020: data collected from 2015 to 2019;
3. Third reporting cycle in 2025: data collected from 2020 to 2024;
4. Fourth reporting cycle in 2030: data collected from 2025 to 2029.

## Calendar

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**Data collection:**

1. First reporting cycle: 2017;
2. Second reporting cycle: 2020;
3. Third reporting cycle: 2025;
4. Fourth reporting cycle: 2030.

**Data release:**

1. First reporting cycle: 2010-2014;
2. Second reporting cycle: 2015-2019;
3. Third reporting cycle: 2020-2024;
4. Fourth reporting cycle: 2025-2029.

## Data providers

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1. Focal Points and Competent Authorities for the Basel Conventions (185 Parties);
2. Designated National Authorities and Official contact points for the Rotterdam Convention (180 Parties);
3. Official contact points and national focal points for Stockholm Convention (156 Parties);
4. Focal points for Montreal Protocol (197 Parties);
5. Focal points for information exchange and national focal points for the Minamata Convention (currently 35 Parties).

## Data compilers

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1. Secretariat of the Basel, Rotterdam and Stockholm Conventions;
2. Ozone Secretariat;
3. Secretariat of the Minamata Convention.

## References

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**URL:**

**References:**

## Related indicators

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Indicators 12.4.2, 12.5.1, 3.9.1, 3.9.2 and 3.9.3.