UNECE-CES Steering Group
on Climate Change-Related Statistics

CLIMATE CHANGE-RELATED STATISTICS IN PRACTICE 2022

CONTENT

1. BACKGROUND

This document presents an overview of recent activities, plans and challenges of national and international organizations working on climate change-related statistics.

For the last nine years, the annual UNECE Expert Forum has been the main platform for NSOs from the UNECE region to exchange experience and discuss difficulties encountered in producing climate change-related statistics. Good practices in climate change-related statistics presented at the Expert Fora or submitted by countries and organizations have been published on a wiki maintained by the UNECE Steering Group on Climate Change-Related Statistics.

In October 2020, the Steering Group proposed **strengthening the collection and dissemination of good practices in climate change-related statistics** by conducting an annual exercise of collecting and sharing information about new achievements and plans. In 2021, the Steering Group for the first time invited countries and international organizations participating in the work under the Conference of European Statisticians (CES) to share information about their work on climate change-related statistics through a short questionnaire. The results of this exercise are available in the document "Climate Change-Related Statistics in Practice 2021".

The 2022 questionnaire was sent in June and included specific questions linked to the current year's Expert Forum topics. The submissions and consent for the responses to be shared were voluntary. The collected information is presented in this document and will also be published on the good practice wiki.

Chapter 2 of this document summarizes the information provided by national organizations in an aggregated manner. Chapter 3 presents information about activities and achievements by each country, with links to data and pages where more information can be found. The descriptions reflect only the activities that organizations shared share in the questionnaire and do not necessarily cover all the activities carried out in each country. **The country descriptions are tagged with keywords, are listed in the index at the end of the document.**

Chapter 4 presents updates about activities carried out by international organizations who responded to the form.

All countries and organizations that would like to share information about their experience and achievements are continuously invited to submit entries to the good practice wiki, offer presentations and papers to the annual Expert Fora and contribute to the next editions of this exercise.

All the resources produced by the Steering Group on Climate Change-Related Statistics can be found at: https://unece.org/statistics/climate-change.

2. REGIONAL OVERVIEW

Introduction

This chapter presents a summary of the information provided by national organizations in an aggregated manner. Individual information submitted by the countries can be found in chapter 3. "Country achievements and plans".

Thirty three countries responded to the questionnaire: Armenia, Austria, Azerbaijan, Belarus, Bosnia and Herzegovina, Canada, Chile, Costa Rica, Cyprus, France, Germany, Greece, Hungary, Ireland, Japan, Kazakhstan, Kyrgyzstan, Lithuania, Luxembourg, Malta, Mexico, Poland, Romania, Russian Federation, Serbia, Slovenia, South Africa, Sweden, Switzerland, the Netherlands, Ukraine and the United Kingdom. Responses were also received from the United Nations Statistics Division and Adaptation Research Alliance.

Areas of climate change-related statistics

Among the responding countries, 27 countries indicated that they produce statistics or indicators concerning GHG emissions and their human causes. Second are most commonly mentioned was mitigation (22), closely followed by drivers (21) and impacts (19). Out of 33, 14 countries reported statistics or indicators on climate change adaptation.

Figure 1. Areas for which statistics or indicators are produced (n=33)
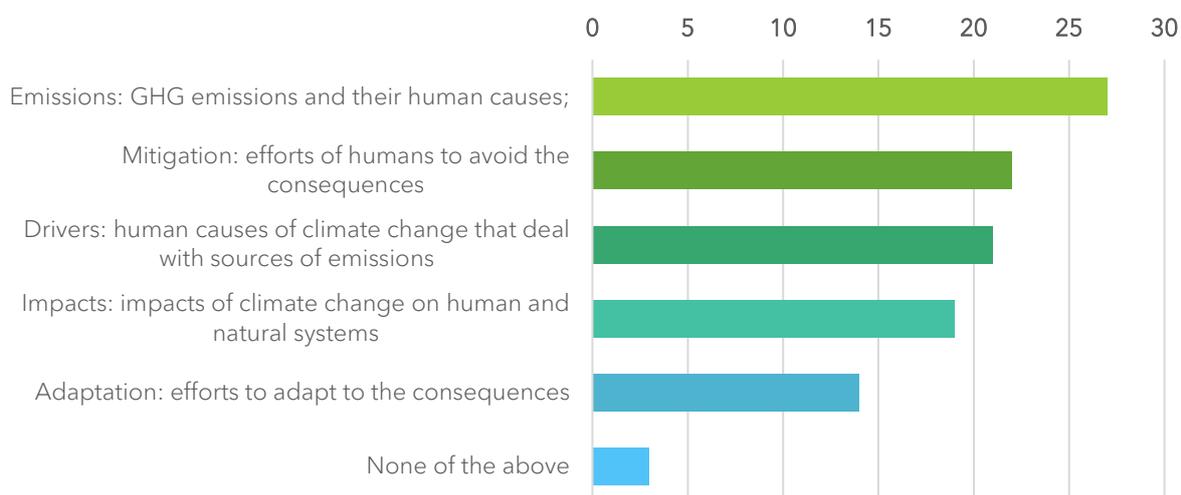
Challenges and obstacles

Insufficient human or financial resources are the primary obstacle to progressing the development of climate change-related statistics in 29 countries. Second most commonly mentioned was data quality and availability (21), followed by methodological challenges (16), the need to use multiple and new data sources (15) and cooperation with stakeholders (13). 11 countries indicated lack of knowledge about climate change and its interactions with other areas as challenging. No country indicated that that do not observe any of these obstacles.

Figure 2. What are the primary obstacles to progressing the development of climate change-related statistics in your organization? (n=33)

Measuring climate risk, impacts and adaptation or resilience

Out of 33 countries, 16 reported carrying out statistical activities related to measuring climate risk, impacts and adaptation or resilience.

Figure 3. Does any of the responding organizations from a given country carry out any statistical activities related to measuring climate risk, impacts and adaptation or resilience levels? (n=33)
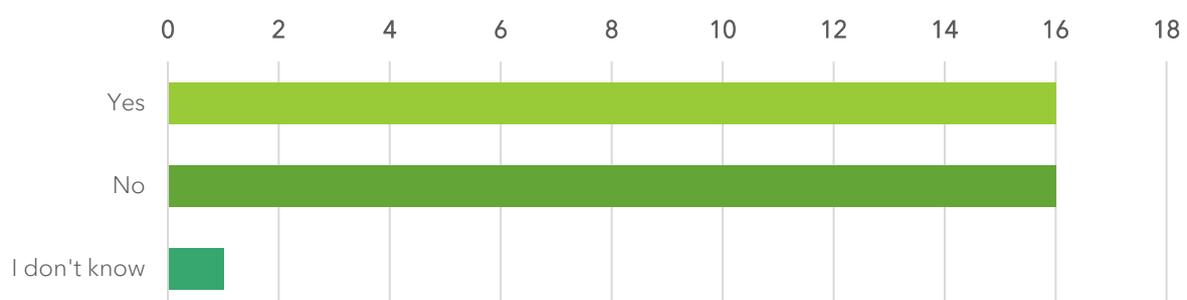
Solving climate change-related data gaps

Figure 4. Has any of the responding organizations from a given country solved any outstanding climate change-related data gaps recently? (n=33)

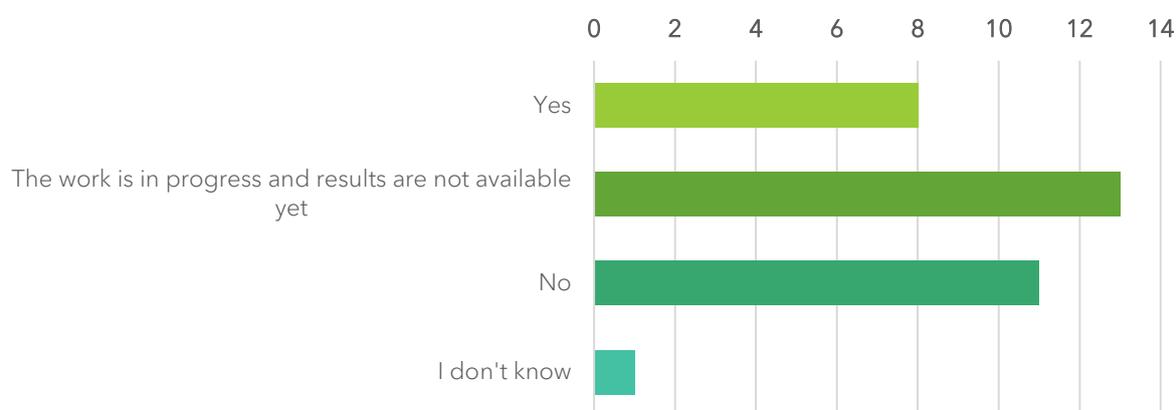8 countries has recently solved some **outstanding climate change-related data gaps**, including the following examples:

- Implementation of the **residence principle** into the Air Emissions Accounts
- Measuring the **economic changes of NACE sectors** with high emissions
- Quantifying how **energy consumption** varies with the energy efficiency of buildings
- Compilation of the fuel and **energy balance** of the country
- Businesses with various climate and nature-related strategies in place
- **Quarterly GHG emissions estimates** (residency basis)
- **Regional emissions** and tourism emissions

Among the work in progress the following activities were mentioned:

- **Sub-annual GHG emission estimates**
- Resolving gaps in **forest phenology**
- Setting up SEEA **Ecosystem Accounts**
- Developing **domestic indicators** that could facilitate the work of the decision makers (in addition to the Global Set and the CES indicators)
- Developing Tier 2 CO2 **emission factors** from the commonly used liquid and gas fuels in the country
- Feasibility study on **ecosystem accounting**, including a thematic account for the ecosystem sequestration
- Providing statistics for the **European Green Deal**

As example of a data gaps which has not yet been resolved, one country mentioned **water availability following a basin approach**.

Climate change and environment in censuses

Figure 5. Does the population and housing census in a given country include any questions related to environment and climate change? (n=33)
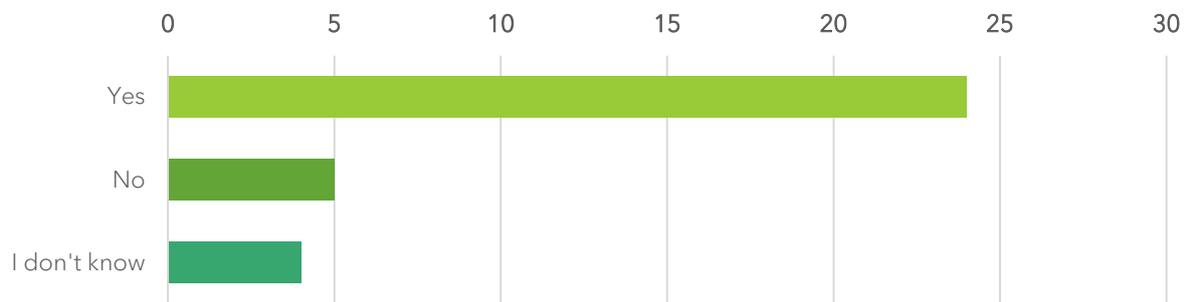
In 24 out of 33 countries, the **population and housing census** includes at least one question related to environment and climate change. Examples of questions are presented in the chapter 3 of these document under each country.

Use of administrative microdata

Figure 6. Does any of the responding organisations from a given country use any administrative microdata for producing climate change related statistics? (n=33)
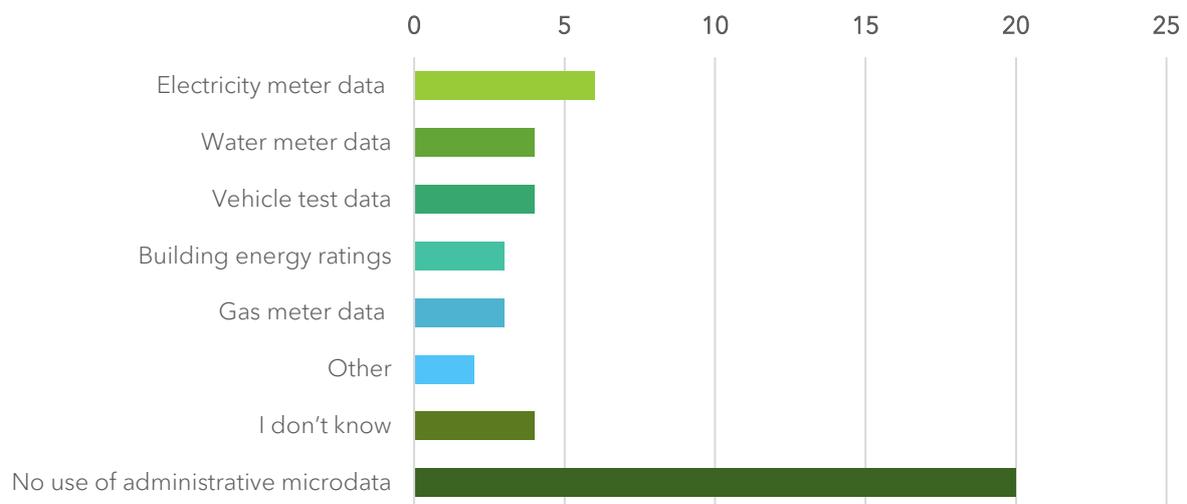
9 out of 33 countries reported using some kind of **administrative microdata** for producing climate change-related statistics. The most commonly used (6 countries) is **electricity meter data**, followed by **water meter data** and **vehicle test data** (4). Building energy rating and gas meter data are used in 3 countries.

In 20 countries, no administrative data is used. As a reasons, two countries mentioned **unavailability or lack of access to such data**.

Improving granularity of climate change-related statistics

Seven countries reported producing subnational GHG emission statistics, while 6 – sub-annual (in all cases, quarterly).

Figure 7. Does any of the responding organisations from a given country currently produce any of the following? (n=33)
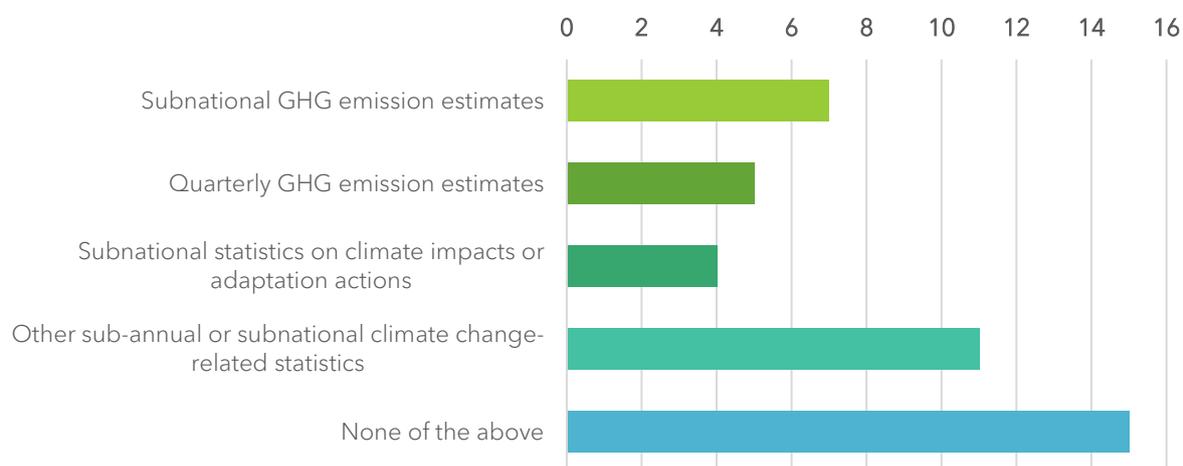
Among the countries that currently do not produce any sub-annual or subnational climate change-related statistics 5, **takes steps to improve the timeliness, frequency or granularity**. 12 countries currently do not take any steps in that directions. As **reasons**, several indicated that they already comply with their mandates and required timeliness or frequency. One country mentioned that they did not receive such demands from users.

Figure 8. Has any of the responding organisations from a given country taken any steps to increase timeliness, frequency, or granularity of climate change related statistics over the past few years? (n=33)
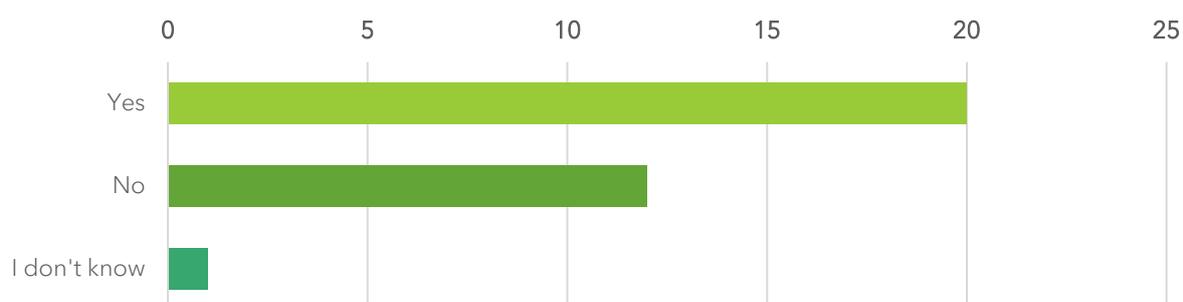
International work

The following **proposals for international work** that would best support the work on climate change-related statistics in the responding organizations organization were provided:

- Improvement of **energy** consumption related data under household surveys
- Improvement of the **transport** related statistics
- Methodological support for calculation of **loss and damage** using internationally agreed guidelines

- Best international experience on **establishment the Enhanced Transparency Framework or MRV system** including integrated data system linking all stakeholders in providing climate-related data would be additional value for amelioration of work on climate change-related statistics
- Support to overcome **limited technical capacities** are evident in statistical institutions, institutional weakness and lack of coordination among national institutions
- **Increase knowledge** of statistical guides for measuring climate change, as well as knowledge focusing on emissions statistics
- More statistics on **drivers**
- **Integrating official statistics in climate change monitoring**
- Linking **Sendai Framework** for Disaster Risk Reduction 2015-2030 in the development of climate change statistics and indicators
- Linking the **SEEA Central Framework**, international statistical standard for measuring the environment and its relationship with the economy
- An **international document describing the two frameworks to report GHGs**, the IPCC and SEEA, including narrative on the benefits, and necessity, of having two sets of data, as well as the uses for both
- Technical cooperation for the i**dentification of needs and the preparation of a roadmap**
- A **reporting obligation** would be likely to launch a dynamic to produce a national dashboard of climate change related statistics and indicators
- **Harmonization between the different international organizations** would facilitate our work on climate change-related statistics. Methodologies can substantially differ in the different international organizations.
- **Methodological work** including developing classifications by adding environment-related products and activities.
- Development of **detailed methodological explanations** on the calculation of indicators of the Global Set of Statistics and indicators on climate change, developed by the Conference of European Statisticians (CES).
- The development of metho**dologies in other climate related areas beyond national inventories** (the IPCC guidelines), that can be accepted widely and provide comparative approaches between countries/regions, in adaptation in order to enable proper focus.
- Efficient **coordination of various initiatives in the field of climate change statistics** and the use of already existing frameworks (e.g. SEEA - System of Environmental-Economic Accounting)
- Databases with **verified emission factors** and emission-related parameters
- **Workshops, forums, methodological tools**
- Contact with **other countries' agencies that have similar perspectives**
- **International agreement on definitions and methodologies** that NSOs can apply and compare
- Sharing of **best practice and innovation**
- **Workshops** on climate change-related statistics, sharing experiences with colleagues from European statistical institutions and organizations, and the **latest developments and information on climate change-related statistics** would be the best support.

A few countries **appreciated the existing resources** including the **Framework for Development of Environmental Statistics**, the **Global Set of Climate Change Statistics and Indicators** and the **CES Core Set of Climate Change-Related Statistics and Indicators** as useful resources available already that help to start the work.

One country highlighted that they directly contribute to capacity development in other countries and international organisations e.g. through **placement of national experts in many foreign countries and organizations**.

One country recognized the **usefulness of data from international organizations** as supplementary source to the data collected from domestic providers.

3. COUNTRY ACHIEVEMENTS AND PLANS

Armenia

Submitted by the Statistical Committee of the Republic of Armenia

Recent achievements
The Road Map for the development of climate change-related statistics in the Republic of Armenia (https://www.armstat.am/file/doc/99525613.pdf) was developed with the support of the UNECE Statistical Division and based on consultations with the Ministry of Environment was approved by the Armstat Board in 2020. It was published on the Armstat website and serves as reference for planning and implementation of different initiatives.

In accordance with the Road map Priority 1.3 "Improve the quality of official statistics used for GHG inventories" the **coherence between statistical data used for Energy Balance and GHG Inventory** were ensured.

Priority 6 "NSOs should consider development of new statistics based on a review of the key data needs of CC policy makers and analysts in their country" with the support of UNDP **methodology for compiling air accounts was developed**, pilot air accounts for 2017 was prepared and future activities were defined. These actions are aimed at harmonization of long-range transboundary air pollution data with the data reported under the Climate Change Convention and Paris Agreement.

Key development plans
Representatives from Armstat are involved in different climate change statistics related international and intergovernmental task forces and working groups.

The Armenia's National Adaptation Plan has been developed and approved by the Government of RA on 13 May 2021, and is available under the following link: https://unfccc.int/sites/default/files/resource/NAP_Armenia.pdf

The updated Nationally Determined Contributions under Paris Agreement was approved by the Government Decree 610-L in April 2021.

With UNDP support Armstat has initiated SEEA - Air accounts, however there is need to be completed in conjunction with the GHG inventory updates.

Armstat hold consultations with GHG compilers to plan actions for filling **gaps related to the climate statistics in agriculture, forestry and other land use sectors**, including :

- Register on agricultural waste (manure);
- Firewood use by households;

- Household alternative production and use of biofuels

Areas of statistics and indicators produced and examples
- Here is an Armstat webpage link to the Indicators which are included in the Global Set:
  https://statbank.armstat.am/pxweb/en/ArmStatBank/?rxid=9ba7b0d1-2ff8-40fa-a309-fae01ea885bb
- The Third Biennial Update Report of the Republic of Armenia is developed according to the United Nations Framework on Climate Change (UNFCCC) Decisions and provides the updated information on national circumstances, greenhouse gas inventory, progress in mitigation policies and actions, measurement, reporting and verification system as well as on support received and needs. (https://unfccc.int/sites/default/files/resource/BUR3_Armenia.pdf)

The key challenge is **the indicators for tracking the climate vulnerability and economic, social impacts and losses due to climate change and climate extremes**.

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
Armstat cooperates with the Ministry of Emergency Situations, which is collecting and reporting data on losses due to different emergences, including from weather extremes.

The **agriculture index insurance pilot project** funded by the Government and KfW bank is working with private insurers, it is planned to conduct consultations for understanding on possible ways for sharing data on registered losses.

Solving climate change-related data gaps
Armstat is working on addressing several climate related data gaps:

- **Air Emissions Accounts for Armenia**: Data evaluation and road map for implementation is available under the link: https://drive.google.com/file/d/1ms-_86k8-MKDB8StyZcjMXuKZ5Fxxxzx/view
- New reporting form "**Urban Green Areas**" is under development for improvement of GHG inventory.
- To improve the **administrative register of the agricultural sector** in relation to climate change, the issue of accounting the different manure management practices, pesticides and fertilizers is suggested to be discussed at the upcoming session of the Interagency Coordination Council for the Implementation of the Requirements and Provisions of the UN Framework Convention on Climate Change and the Paris Agreement.
- For the purpose of continuous **improvement of energy statistics, its harmonization and unification with international standards**, as well as ensuring international comparability of statistical indicators and modernization of collected indicators, Armstat has revised statistical reporting form, in particular, for the possibility to separate energy consumption data according to NACE rev.2.

Climate change and environment in population and housing censuses
The latest Population Census (https://www.armstat.am/en/?nid=532) has been carried out in 2011. The census included e.g. information on households (urban, rural) according to the main source of water supply to the residential unit and the type of residential building (https://www.armstat.am/file/doc/99486403.pdf).

In the Household Survey which is carried out annually (the latest publication for 2020) environmental and climate change related questions are also included, e.g. Armenia – non-material poverty

Improving granularity of climate change-related statistics
Armstat produces subnational statistics on climate impacts or adaptation actions and other sub-annual or subnational climate change-related statistics and takes steps to further improve granularity and timeliness of its statistical products.

The weather observation stations data are published the following bulletins (in Armenian and Russian) **on monthly basis**:

- Brief characteristics of hydrometeorological condition
- Monitoring of environmental pollution

The main publication **Environment and Natural Resources** in the Republic of Armenia for 2020 (https://www.armstat.am/en/?nid=82&id=2420) provided data on **sub-national level** (by regions/marzes and by water basin management areas).

Timeliness and frequency of statistical reports are regulated by the Code on Administrative Offenses (Article 1692), Five-year Statistical Program of RA for 2019-2023 (https://www.armstat.am/file/doc/99511048.pdf) and Annual Statistical Programs (Armenian) (https://www.arlis.am/Annexes/6/2021_N18hav.pdf) which will be strictly applied in the integrated platform of statistical reporting system.

The latest example on improving the granularity is gender definition among the number of casualties from registered emergency events (available in Armenian at https://www.armstat.am/file/article/eco_book_2020_15.pdf).

Azerbaijan

Keywords: Emissions, Mitigation, Adaptation, Risk, impacts and adaptation, Population and housing census, Water meter data, Gas meter data, Electricity meter data, Subnational GHG emissions, Subnational statistics on climate impacts or adaptation actions, Increasing granularity and timeliness, GHG inventory, Hydrometeorological data, National climate change statistics and indicators, Energy efficiency, Water, Analysis

Submitted jointly by the National Hydrometeorology Service under Ministry of Ecology and Natural Resources of Republic of Azerbaijan and State Statistical Committee of the of Azerbaijan

Recent achievements
On 11 March 2020, the **State Commission on Climate Change** was formed by the Decree of the President of Azerbaijan Republic No. 1920 dated, in order to intensify activities to fulfil relevant commitments of the Republic Azerbaijan under UNFCCC as well as Paris Agreement. The Commission consists of the relevant ministries and other involved entities. According to the protocol No. 5 of the meeting (online) of the Commission dated July 23, 2020, the relevant Working Group was established and its Action Plan was approved. Moreover, early in 2022, the relevant Secretariat of the Commission was established under the auspices of the Ministry of Ecology and Natural Resources

One of the main focuses of the State Commission is **to ameliorate the Measurement, Reporting and Verification system** (MRV) in the country, that means to enhance inter-governmental cooperation on collection of activity data for GHG inventory and NDC tracking, data quality should address requirements of IPCC 2006 inventory guidelines and ensure submission of Azerbaijan first Biennial Transparency Report, ensure quality of data provided, appropriate choice of emission factors, allow technical verification of the results of policies and measures implemented to reduce climate change impact, final quality assurance procedure, improvement plan development and archiving of the climate-related data etc. All these procedures will enable to prepare **new, high quality climate-related statistics.** Actually, assessment of GHG emissions volumes from different sectors covers the period1990-2020 , for several key categories identified according to IPCC 2006 guidelines assessment of the emissions level was performed using Tier 2 approach. All the results of the calculations have been published in the relevant part of the official page of State Statistics Committee of Republic of Azerbaijan. https://www.stat.gov.az/source/environment/

Though the **early warning system** is in the initial phase of the construction, it succeeded to collect the information about flood in the risk areas of the country and all this information have archived in the data base of the relevant organization.

Key development plans
As it mentioned in the first answer, effective setting of MRV system of GHGs emissions is one of the main the priorities in the country. It is planned to enhance level of disaggregation of the statistical data to allow use of Tier 2 or Tier 3 approach for GHG emissions assessment at least for key categories identified in Forth National Communication to UNFCCC. Moreover, according to the Social-Economic Development Strategy for 2022-2026 adopted by President Decree on 22 of July 2022 Ministry of Ecology and Natural resources and State Statistical Committee shall create **National Climate Change database**. Moreover to support national GHG inventory towards Enhanced Transparency Framework (ETF) it is envisaged to create reliable MRV system, main implementing ministry is MENR. All these efforts will contribute to the quality if climate-related statistics.

Additionally, exp**anding the network of the hydrometeorology services and information collections** in the whole area of the country, especially the liberated areas, increase the efficiency of data collections are also priority for the next years.

We plan to use more effective climate related statistical information in all levels of management.

For this purpose, a **new centre for visualization of climate related information** has been set.

Areas and examples of statistics produced
Examples include:

- https://www.stat.gov.az/source/environment/
- https://unfccc.int/sites/default/files/resource/FNC%20report.pdf
  (4th National Communication of Azerbaijan)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
Information about risks in the different areas are collected by National Hydromet Service of Ministry of Ecology and Natural Resources such as **flood information in the risk areas, heat waves, abnormal heat and cold weather information** and all the other meteorological events. But the statistical information doesn't cover the level of hazard, exposure and vulnerability. All the work related to these mentions are separated and covered by different programs.

Climate change and environment in population and housing censuses
The questionnaire of the population census conducted in 2019 included **questions related to the housing and communal conditions of households** (provision of electricity, centralized gas supply, water supply, and heating system). The data collected from the population census have been processed, and the results are currently being printed, which will soon be posted on the website of the State Statistics Committee (stat.gov.az).

In addition, the State Statistics Committee annually collects information on the housing stock (statistical reporting 1-housing fund). Based on the collected data a statistical bulletin is issued in the national language, as well as the result of the report is published both in the national and English languages in the yearbook "Health, social protection, sports", section "Housing conditions" (https://www.stat.gov.az/source/healthcare/?lang=en)

Use of administrative microdata
Azerbaijan uses water meter data; gas meter data and electricity meter data for producing climate change-related statistics.

Water meter data are used for early warning systems to prevent floods and forecast water scarcity to develop climate adaptation actions.

Gas meters are widely in use in Residential and commercial buildings to form data on natural gas consumption. Industrial use of gas meters for natural and associated gas production, transmission and distribution, as well as to ensure industrial processes.

Electricity meters use to envisage energy efficiency measures in form of a mitigation actions and to find energy intensive process in industry.

Improving timeliness and granularity of climate change-related statistics
Subnational GHG emission estimates are going to be provided, once new NDC (Nationally Determined Contributions) document is submitted to the UNFCCC Secretariat.

Each year National Hydrometeorological Service of the Ministry of Ecology and Natural Resources of Azerbaijan along with other related organizations prepares **water balance statistics** covering various last 3 years and 2 years forecasting reports, where it's included water balance of basins of main rivers and lakes of the country, this document is due to be approved by the government till July of every year.

Over past three years, estimation of **effects of the mitigation policies and actions** has been calculated in a special LEAP (Low Emissions Analysis Platform), which is broadly use in developed countries and that's much more effective in terms of accuracy, adequacy and timeliness (https://unfccc.int/documents/299472) Moreover, in the inventory of the fugitive emissions in some key categories the calculation Tier has been upgraded. Moreover, in the adaptation statistics there have been used forecast modelling tools of the developed countries.

Belarus

Keywords: Drivers, Emissions, Impacts, Mitigation, Adaptation, Solving data gaps, Population and housing census, Subnational statistics on climate impacts or adaptation actions, Increasing granularity and timeliness, National climate change statistics and indicators

Submitted by Belstat

Recent achievements
Over the last few years, Belstat has developed:

- System of Green Growth Statistical Indicators:
  https://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/green-growth-indicators/
- The Shared Environmental Information System:
  https://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/the-shared-environmental-information-system/
- SDG climate change indicators:
  http://sdgplatform.belstat.gov.by/en/sites/belstatfront/home.html
- Statistical classifier "Environmental protection activities", based on the International Classification of Environmental Protection Activities and Expenditure (CEPA 2000):
  https://www.belstat.gov.by/klassifikatory/statisticheskie-klassifikatory/

Key development plans
All available data is the baseline information for the development of the National Inventory of Climate Change Indicators. The work is planned for 2023-2025.

Areas and examples of statistics produced
- System of Green Growth Statistical Indicators:
  https://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/green-growth-indicators/
- Shared Environmental Information System:
  https://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/the-shared-environmental-information-system/
- SDG climate change indicators:
  http://sdgplatform.belstat.gov.by/en/sites/belstatfront/home.html
- Short data book "Environmental Protection in the Republic of Belarus":
  https://www.belstat.gov.by/en/ofitsialnaya-statistika/macroeconomy-and-environment/okruzhayuschaya-sreda/publications_2/index_56010/ .

Climate change and environment in population and housing censuses
The recent population and housing census included some questions related to climate change or environment.

See:
https://census.belstat.gov.by/saiku/?guest=true&lang=en&default_view_state=edit#query/open//public/F805N_en.saiku

Improving granularity of climate change-related statistics

Green Growth Statistical Indicators and indicators of the Shared Environmental Information System are available at the regional level.

Data on climate change related statistics are published annually, by the country and by regions and the city of Minsk.

Chile

Keywords: Solving data gaps, Air pollution, SDGs, Environmental statistics, Global Set of Climate Change Indicators and Statistics, Remote sensing, Agriculture, Satellite data, Forests, Waste

Submitted by National Institute Statistics of Chile

Recent achievements

Since 2012, the National Institute Statistics, through the Subdepartment of Environmental Statistics, has developed a System of Basic Environmental Statistics (SEBA), managing to transform the statistical heritage into a **structured and documented information base of Basic Environmental Variables (VBA) and their respective time series.** There are currently more than 400 VBAs, some of which are directly related to climate change statistics.

In relation to the **Sustainable Development Goals (SDGs),** INE is the technical advisor for these indicators, which involves the review and validation of indicators delivered by the economic, social and environmental subcommittees. As for the indicators of an environmental nature reported by the country, there are some related to SDG 13 for climate action, the objective of which is to adopt urgent measures to combat climate change and its effects.

In addition, in 2021, the Subdepartment of Environmental Statistics, together with the Ministry of the Environment, responded to the **Global Consultation of the Set of Climate Change Indicators and Statistics**, prepared by the United Nations Statistics Division.

Key development plans

The Subdepartment of Environmental Statistics makes their basic environmental variables available, considering that several of them could serve as input in the preparation of environmental indicators or statistics related to climate change.

In turn, there is cooperation between institutions that provide useful information for the preparation of environmental statistics and/or related to climate change. The possibility of generating these types of statistics using **remote sensing** is also being evaluated.

If possible, options to address climate change statistics in line with the methodologies of the Subdepartment will be evaluated later.

Areas and examples of statistics produced

Every year, products such as the Annual Environment Report, time series (databases), and statistical tables related to the environment are published. These statistics are requested from various informants, including General Water Directorate (DGA), Chilean Meteorological Directorate (DMC), Ministry of the Environment (MMA), National Forestry Corporation (Conaf) among others. In total there are more than 30 public institutions.

Based on the information provided by these institutions, VBA associated with **agriculture, pollutant emissions, mining, waste, pollutant concentrations**, and their corresponding data series are prepared, which in some cases could be related to climate change statistics.

More information is available at the following link: https://www.ine.cl/estadisticas/economia/energia-y-medioambiente/variables-basicas-ambientales

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
Although there is currently information linked to some indicators on climate change, it is necessary to identify whether it is possible to include new variables with the structure and time frame required for it.

Solving climate change-related data gaps
INE is currently working on resolving gaps in **forest phenology**, this can serve as an indicator of climate change in Chile's parks and reserves, and to resolve it we are evaluating the **incorporation of satellite data**.

Costa Rica

Keywords: Risk, impacts and adaptation, Solving data gaps, Population and housing census, Emissions, Impacts, Mitigation, Adaptation, Electricity meter data, Vehicle test data, Increasing granularity and timeliness

Submitted by Instituto Nacional de Estadística y Censos of Costa Rica

Recent achievements
Instituto Nacional de Estadística y Censos (INEC) of Costa Rica participates as a statistical technical advisor in the **Committee of the National Climate Change Metrics System**.

Partnership whit Ministry of Environment and Energy (MINAE) (the main institution that produces environmental information) is in the process of developing the **National Report on the State of the Environment**, for which it has scheduled a series of consultations and exchanges with the institutions that generate all types of environmental information, including information on climate change.

INEC also participate in the Task Force on the role of national statistical offices in achieving national climate goals of the United Nations Economic Commission for Europe (UNECE).

Key development plans
INEC will provide the statistical technical advice required by the MINAE Climate Change Directorate, for the strengthening of statistics related to climate change.

Climate change and environment in population and housing censuses
The last population and housing census was conducted in 2011 and included some questions related to environment or climate change https://www.inec.cr/censos/censos-2011. Information from the 2022 Census is currently being collected

Cyprus

Keywords: Emissions, Mitigation, Population and housing census, GHG inventory, Energy statistics and energy balances

Submitted by Statistical Service of Cyprus

Recent achievements
The Department of Environment (Ministry of Agriculture, Rural Development and Environment) is responsible for the climate change policy in Cyprus. However, the NSO provides data as required by the Department of Environment, that are used in the preparation of the country's GHG inventory. These include **Energy Balance**, **Clinker Production**, **Annual imports of disodium carbonate, paraffin wax, carbides of calcium**, **Number of animals**, **Crops area and production**, **GDP by domain**, **Production and treatment of municipal solid waste (MSW)**, **Per capita production of MSW**, **Sales of Industrial Commodities By Type**.

Moreover, official statistics are produced for **Air Emissions Accounts and Environmental Taxes by NACE Rev. 2 activity** based on Regulation (EC) No. 691/2011 on European environmental economic accounts (EEEA). Results can be found on Eurostat's website. https://ec.europa.eu/eurostat/web/main/data/database

Detailed data are also available in the field of **Energy Statistics**, that are transmitted to Eurostat and related indicators to climate change like "**Renewable Energy share in total energy use**" are produced. Data and indicators can be found on Eurostat's website.

Climate change and environment in population and housing censuses
The 2021 population census questionnaire included questions on the type of heating, the use of solar energy and the existence of air conditioning facilities, see the following link: https://www.census2021.cystat.gov.cy/images/Census%202021%20QST-EN_.pdf

France

Keywords: Drivers, Emissions, Impacts, Mitigation, Adaptation, Risk, impacts and adaptation, Population and housing census, National climate change statistics and indicators, Environmental statistics, Global Set of Climate Change Indicators and Statistics, CES Set of Core Climate Change-Related Statistics and Indicators, Carbon footprint, Planetary boundaries, Public opinion

Submitted by the Ministry of Environment – French statistical office

Recent achievements
New developments on:

- Carbon footprint
- Use of Planetary boundaries concept to communicate the data
- Annual updating of Climate Change-related Key figures
- Development of data collection on Climate Change mitigation-related expenses and Climate Change adaptation-related expenses, in accordance with the regulation on European Environmental account.

Key development plans
Key development plans include beginning of the implementation of the UNSD set of Core Climate Change-related Indicators and Statistics and the CES Set of Core Climate Change-related Indicators and Statistics. This will entail collecting relevant statistics, calculation of indicators etc.

Areas and examples of statistics produced
Every year, the French environmental statistics office produces **climate change related key figures and updates the French carbon footprint**. They are published on its website :

- https://www.statistiques.developpement-durable.gouv.fr/chiffres-cles-du-climat-0?rubrique=26
- https://www.statistiques.developpement-durable.gouv.fr/empreinte-carbone-2?rubrique=27
- https://www.statistiques.developpement-durable.gouv.fr/changement-climatique
- https://www.statistiques.developpement-durable.gouv.fr/bilan-environnemental-de-la-france-edition-2021?rubrique=41&dossier=176
- https://www.statistiques.developpement-durable.gouv.fr/risques-climatiques-six-francais-sur-dix-sont-dores-et-deja-concernes?rubrique=43&dossier=200

Every four years, the French environmental statistics office produces **the French state of environment report**, covering also climate change and hazards:

- https://notre-environnement.gouv.fr/donnees-et-ressources/ressources/rapport-sur-l-etat-de-l-environnement-en-france/article/rapport-l-environnement-en-france-edition-2019

Every ten years, French environmental statistics launches a survey which aims to evaluate the **level of French people concern on naturals hazards et climate change effects** :

- https://www.statistiques.developpement-durable.gouv.fr/risques-climatiques-six-francais-sur-dix-sont-dores-et-deja-concernes?rubrique=43&dossier=200

The *Observatoire national sur les effets du réchauffement climatique* – ONERC (National Observatory on the Effects of Global Warming) collects and disseminates information on the **risks linked to global warming**. It has a set of 29 indicators:

- https://www.ecologie.gouv.fr/observatoire-national-sur-effets-du-rechauffement-climatique-onerc#scroll-nav__3.

L'Institut de l'Economie du Climat -I4CE (institute for climate economics) publishes studies on the costs of mitigation and adaptation measures to be implemented : https://www.i4ce.org/publication/moyens-adaptation-consequences-changement-climatique-france/

- https://www.i4ce.org/publication/edition-2021-panorama-des-financements-climat/

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
Regularly, the French environmental statistics office improves and updates the climate change-related indicator on the **Population exposure to climate risks**:

- https://www.statistiques.developpement-durable.gouv.fr/risques-climatiques-six-francais-sur-dix-sont-dores-et-deja-concernes?rubrique=43&dossier=200
- https://www.statistiques.developpement-durable.gouv.fr/sites/default/files/2020-05/datalab_essentiel_202_climatic_risks_january2020.pdf

By the beginning of 2023, the National Office for Environmental Statistics will publish a **natural hazards related key figures notebook**.

Indicators on natural risks and their evolution are gathered under https://www.georisques.gouv.fr/articles-risques/onrn/acceder-aux-indicateurs-enjeux

Climate change and environment in population and housing censuses
The last population and housing census did not include information on the connection to water supply and wastewater and partially included the use of renewable energy.

The French environmental statistics office has launched a specific survey about housing.

Germany

Keywords: Drivers, Emissions, Solving data gaps, Population and housing census, Other sub-annual or subnational CCRS, Increasing granularity and timeliness, SEEA, Ecosystem accounts, Carbon footprint, Environmental taxes and subsidies

Submitted by Federal Statistical Office (Destatis)

Recent achievements
"Climate Change-Related Statistics" is a very broad cross-sectional topic relevant in many individual statistical areas and also in Environmental-Economic Accounts in numerous places. Within Environmental-Economic Accounts, we have developed CO2 footprint calculations and we are building up ecosystem accounts (SEEA EA).

Key development plans
A broad-based expansion of statistics and accounting systems is currently in progress. This concerns both primary data collection and the use of administrative data, as well as the expansion of geodata use within the framework of ecosystem accounting.

Areas and examples of statistics produced
Destatis produces the following data on climate change drivers and GHG emissions:

- Results from environmental-economic accounts, detailed version in German, reduced content in English (www.destatis.de/ugr)
- Cross-cutting data presentation in German only (www.destatis.de/klima)

Solving climate change-related data gaps
Setting up SEEA EA will inform on the extent, condition and in future on the service of ecosystems. This will close a huge variety of data gaps. In addition, work is ongoing on climate change related issues such as subsidies and similar transfers.

Climate change and environment in population and housing censuses
The 2022 population and housing census included questions on:

- Heating system and main energy source

- Age and type of house.

Improving granularity of climate change-related statistics;
Due to the federal structure of the Federal Republic of Germany, the statistical offices of the Länder are mainly responsible for results at the Länder level. In some areas, e.g. the use of geodata in the Ecosystem Account, small-scale results are also calculated and published by the Federal Statistical Office. In addition, some results from primary surveys are also produced by us at the country level.

The EU regulation 691/2011 on European environmental-economic accounts has been changed by the delegated act 2022/125. In particular, the publication dates for environmental taxes and material flow accounts were significantly moved forward. The new deadlines can be met by using estimates instead of accurate source data only.

Greece

Keywords: Drivers, Emissions, Impacts, Adaptation, Risk, impacts and adaptation, Solving data gaps, SEEA, GHG inventory, Emission Trading System, Expenditure, Population and housing census

Submitted by the Ministry of Environment and Energy and Hellenic Statistical Authority (ELSTAT)

Recent achievements
The Directorate of Climate Change and Air Quality of the Ministry of Environment and Energy has the overall responsibility for **compiling and submitting the national greenhouse gas inventories and national communications**.

The legal framework of the established national inventory system has been updated and improved over the past few years.

For the emissions of fluorinated greenhouse gases (F-gases) a **web platform "Maintenance and monitoring F-gases and ODS**" has been launched. It aims to serve as a tracking tool and a database for users of F-gases and ozone-depleting substances to register their regular checks of maintenance refilling records and for F-gas traders to register their transactions from 2019 onward.

The Hellenic Statistical Authority (ELSTAT) and more specifically the Energy and Environment Statistics Section is responsible for compiling certain accounts (according to regulation EU 691/2011) and statistics such as: **air emission accounts**, **physical flow energy accounts**, **material flow accounts**, **environmental protection expenditure accounts**, **environmental goods and services secto**r, **environmental taxes, water statistics** and **waste statistics.** Certain other significant statistics such as **Energy balances** and **Emission inventories** used for the compilation of these indicators, are compiled from other government ministries or institutions.

The main achievement of the NSI in climate change related statistics is the compilation of Air Emissions Accounts (AEA) by including statistical procedures such as:

- Allocation of air emissions to economic activities (NACE Rev.2) and households
- Implementation of the residence principle into Air Emissions Accounts (AEA)
- Ensuring coherence between the AEA and the energy-related accounts i.e. the Physical Energy Flow Accounts (PEFA).

Certain improvements like the residence principle and the coherence with other domains were recently introduced in the last data collection.

Key development plans
The Directorate of Climate Change and Air Quality coordinates **the LIFE-IP AdaptInGR** project funded by the LIFE Programme of the European Union and the Green Fund of Greece (More info: www.adaptivegreece.gr).

The project has been developing a **national framework to monitor and evaluate climate change adaptation policies.** A first set of indicators for each of the 15 priority sectors of the National Adaptation Strategy has been already developed and a thorough consultation with sectoral authorities is currently underway. Two monitoring & evaluation cycles will follow to further refine and fine-tune the indicators.

The LIFE-IP AdaptInGR project aims to integrate the M&E framework into the National Climate Change Adaptation Observatory recently established by the National Climate Law (art.25).

Regarding the national greenhouse gas inventory there are some planned actions for the **improvement of the estimations of GHGs emissions/removals from various sectors**.

For example, it is planned to develop a **spatially explicit land use change data for the Land Use, Land-Use Change and Forestry (LULUCF) sector**.

Areas and examples of statistics produced
The latest **National Inventory Report** submitted in 2022 is available at the following link: https://unfccc.int/documents/461961.

The 7th **National Communication** submitted in 2017 is available at https://unfccc.int/documents/198255 and the 4th Biennial Report submitted in 2020 is available at https://unfccc.int/documents/209648.

The **8th National Communication** and the **5th Biennial Report** will be submitted by the end of 2022.

LIFE-IP AdaptInGR: As already mentioned, a first set of indicators for each of the 15 priority sectors of the National Adaptation Strategy has been already developed and a thorough consultation with sectoral authorities is currently underway. The consultation is expected to conclude by the end of 2022. Two monitoring & evaluation cycles will follow to further refine and fin-tone the indicators. **The set of indicators is expected to get finalised by 2026** at the latest.

Air Emission Accounts are available at ELSTAT's website (https://www.statistics.gr/en/statistics/-/publication/SOP08/-)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
LIFE-IP AdaptInGR: See more details about the national framework to monitor and evaluate climate change adaptation policies under key development plans above.

The Greek NAS is implemented through 13 Regional Adaptation Action Plans (RAAPs). The 13 RAAPs have been drafted and are expected to get endorsed by the Regional Councils by the end of December 2022. The RAAPs include climate change vulnerability and impact assessment per sector.

Climate change and environment in population and housing censuses
The latest **Population-Housing Census** in Greece was conducted in 2021. The preliminary Census' results are published at the following link: https://www.statistics.gr/en/2021-census-pop-hous-results

The following climate change-related questions were included in the Census questionnaire:

- What are the main energy sources for (a) heating, (b) cooling, (c) cooking, and (d) producing hot water in your premise?
- Does your premise have any kind of thermal insulation (e.g. double glasses, external insulation, etc.)?
- How many personal cars does your household own?

Use of administrative microdata
The data of the verified emissions from stationary installations within the European Emission Trading System (EU ETS) is a basic source of information for the greenhouse gas inventory compilation. It covers almost the half of the national GHG emissions.

Ireland

Keywords: Drivers, Emissions, Impacts, Mitigation, Adaptation, Risk, impacts and adaptation, Solving data gaps, Population and housing census, Water meter data, Gas meter data, Electricity meter data, Building energy ratings, Vehicle test data, Other sub-annual or subnational CCRS, Increasing granularity and timeliness, Hydrometeorological data, Agriculture, Linking climate, economy and society, Electric vehicles, Forests, Energy efficiency

Submitted by Central Statistics Office of Ireland

Recent achievements
The scope of the environment statistics covered by the statistical office broadened to include **forestry**, **environmental-social**, and **ecosystem domains**. We have obtained access to more **environment-related administrative microdata** which we use for many purposes including compiling our basic statistics.

Our statistical releases are available at https://www.cso.ie/en/statistics/

Key development plans
CSO wants to:

- Examine the **long-term economic situation of NACE sectors with high emissions** to determine whether they can **transition to a low carbon economy** while maintaining their economic performance. If a sector has to reduce activity levels to reduce emissions then policy-makers need to be aware of the need for new job creation.
- Publish **vehicle odometer statistics**. These will show the annual vehicle kilometres travelled by different types of vehicles including electric and hybrid.

- Publish daily **meteorological data** that we have computerised covering the period 1870 to 1959. A series will be available for around 150 years which will allow long-term trends to be discerned with more confidence.
- Publish statistics on the **transition to electric vehicles**. Facilities such as charging points need to be provided and households that are not able to afford to change from diesel and petrol vehicles may need financial assistance as part of a Just Transition.
- Compare **building energy ratings** with actual electricity and gas consumption.

Areas and examples of statistics produced

Our releases cover topics such as **energy use** and **air emissions** by NACE sector, **afforestation** and **felling**, **building refurbishments to improve energy efficiency**, trends in the main space **heating fuel of domestic and non-domestic buildings**, trends in **electricity and gas consumption** at meter level, etc.

Statistical activities related to measuring climate risk, impacts and adaptation or resilience

Our **climate data rescue project** will enable us to examine **changes in the frequency of occurrence of meteorological events** such as wet periods, droughts, storms, etc. See https://www.cso.ie/en/methods/climateandenergy/csoclimatedatarescue/

Solving climate change-related data gaps

Progress towards meeting the 2030 climate change targets needs to be measured. We are developing a new release that focuses on **measuring the economic changes of NACE sectors with high emissions**. For example, we will compare changes in the number of family farms and output from **agriculture** with changes in emissions from agriculture. Over time, the release will show whether emissions in agriculture were reduced while maintaining employment and output levels.

Another gap is to quantify **how energy consumption varies with the energy efficiency of buildings.** A family living in a more energy-efficient household may heat the whole house whereas those in a dwelling with poor heat retention may only heat parts of the house. Factors such as living comfort, household income, time spent at home, etc. need to be analysed in conjunction with actual energy consumption and energy efficiency. Results from the CSO Survey on Income and Living Conditions will be an input into this work.

Climate change and environment in population and housing censuses

The 2022 census had questions on central heating fuel, period of construction, water supply, waste water system, building type, vehicle ownership, means of travelling to work or school, use of renewable energy, etc. See https://www.census.ie/help-with-your-form/census-form-explained/

Use of administrative microdata

CSO Ireland uses **water meter data**, **gas meter data**, **electricity meter data**, **building energy ratings** and **vehicle test data**.

The microdata are used in the following way:

- The water meter data shows **trends in consumption** with the difference between the median and mean giving an indication of the repair of water leaks.

- The gas meter shows domestic and non-domestic consumption. The quarterly data provide an indication of **space heating**.
- The electricity meters show **domestic and non-domestic consumption**. The quarterly data provide an indication of space heating. The data can also be used for other purposes such as thematic releases on data centres and electric vehicle public charge point consumption.
- The **building energy ratings** show trends in the energy efficiency of dwellings arising from stricter building standards. More energy efficient dwellings may use electricity for heating rather than solid fuels, oil, and gas. The energy ratings can be combined with census data to show the socio-economic situation of households in less energy-efficient dwellings.
- **Vehicle odometers** will provide information on the annual kilometres travelled by fuel type and urban/rural location.

Improving granularity of climate change-related statistics
We publish **monthly** fuel excise clearances and quarterly building energy ratings.

We publish **utility and other statistics at county level** and are developing a set of **county indicator**s to assist local authorities to monitor progress in their region towards a **low carbon society and economy**.

Japan

Keywords: Emissions, Impacts, Adaptation, Risk, impacts and adaptation, Solving data gaps, Increasing granularity and timeliness

Submitted by the Ministry of Internal Affairs and Communications

Recent achievements
In December 2020, the government compiled and published the Assessment Report on Climate Change Impacts in Japan, see: https://www.env.go.jp/content/000047546.pdf

Areas and examples of statistics produced
The next Assessment Report on Climate Change Impacts in Japan will be compiled in around 2025 after gathering findings on climate change impacts.

Based on the Climate Change Adaptation Plan, which was revised in October 2021, 66 KPIs will be set in relation to sectoral and fundamental measures to keep track of yearly changes and will be used to accurately evaluate the progress of individual measures according to the Plan. Indicators to evaluate the progress of medium- to long-term climate change adaptation will also be established to determine the effectiveness of adaptation measures every five years.

- Climate Change Adaptation Plan (approved by the Cabinet on October 22, 2021): https://www.env.go.jp/content/900449799.pdf
- KPIs for sectoral measures set in the Climate Change Adaptation Plan (approved by the Cabinet on October 22, 2021) https://www.env.go.jp/content/900449801.pdf
- KPIs for fundamental measures set in the Climate Change Adaptation Plan (approved by the Cabinet on October 22, 2021) https://www.env.go.jp/content/900449803.pdf
- Emissions: https://www.env.go.jp/earth/ondanka/ghg-mrv/emissions/ (in Japanese)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience

Research papers and data on domestic **climate change impacts** are compiled and published as the Assessment Report on Climate Change Impacts in Japan. It is updated every five years.

Assessment Report on Climate Change Impacts in Japan is available at https://www.env.go.jp/content/000047546.pdf

Based on the **Climate Change Adaptation Plan**, 66 KPIs related to sector-specific and fundamental measures will be set for short-term management of the progress of measures, and changes in the indicators will be checked every fiscal year to accurately grasp the progress of each measure based on the Plan. In addition, indicators will be set to monitor the progress of climate change adaptation over the medium to long term, and the effects of adaptation measures will be monitored every five years.

Luxembourg

Keywords: Drivers, Emissions, Impacts, Mitigation, Population and housing census, Quarterly GHG emissions, National climate change statistics and indicators, CES Set of Core Climate Change-Related Statistics and Indicators, Water, Hazardous events

Submitted by STATEC – NSI Luxembourg

Recent achievements

Luxembourg was the first country to publish **a national list of climate change related indicators** consistent with the UNECE recommendations.

In addition to the annual update of these indicators, the NSI has participated in several task forces to help in the definition of a global list (UNSD) and a policy-oriented list (OECD).

Key development plans

The floods and droughts of the last two years have raised the level of interest in statistics on **extreme events** and on the **vulnerability** of certain sectors of the Luxembourg economy. STATEC expects to develop them in the coming years.

Nevertheless, the production of statistics aimed at the implementation of GHG emissions mitigation measures remains the main work undertaken and continued in the coming months.

Areas and examples of statistics produced

In the last publication, we added an infographic to interest the general public:

- Le changement climatique : la perspective des ménages résidants - Statistiques - Luxembourg (public.lu)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience

Currently there are no statistical activities in this area, but there has been recently some informal discussions between ministries to start some work (see key development plans).

Solving climate change-related data gaps

Water availability will be a major issue in the future. At this stage, statistics aim to quantify this problem at national level, but this is not the right level of analysis. A basin approach is needed. The production of statistics at this level still requires many developments (data collection, modelling, etc.)

Climate change and environment in population and housing censuses

One question on heating system was included in the last census (reference year 2021).

Improving granularity of climate change-related statistics

STATEC (NSI Luxembourg) publishes **quarterly the CO2 emissions from energy combustion** according to a territorial approach. Th results are available [here](#). A project is planned (2022-2023) to extend these quarterly estimates to other GHGs.

Malta

Keywords: Emissions, Solving data gaps, Population and housing census, Air pollution, SEEA, GHG inventory, Projections, SDGs, Dissemination, Agriculture, Linking climate, economy and society, Emission Trading System, Transport, Waste, Analysis, Impacts, Risk, impacts and adaptation, Increasing granularity and timeliness, Mitigation

Submitted by the National Statistics Office, Ministry for the Environment, Energy and Enterprise, and Malta Resources Authority - GHG Inventory Agency of Malta[1]

Recent achievements

National Statistics Office

In the last years, the National Statistics Office has started compiling the **Physical Energy Flows Accounts** (PEFA) from reference year 2016 onwards and the **Air Emission Accounts** (AEA) covering the timeseries from 1990 to 2020. The latter is based on the national **GHG Inventory** compiled by the Malta Resources Authority and the Environment and Resources Authority and the PEFA. Both the PEFA and AEA are compiled and transmitted to Eurostat in line with Regulation (EU) 691/2011.

During 2021, the NSO has been involved in identifying existing data sources and statistical products (national and international) that are compliant with the methodologies of **the UN SDG indicators framework**. Moreover, to reduce the data-gaps the NSO has also identified other data and statistical products, which although not in conformity with the methodology of the SDG indicators are still relevant for the monitoring of progress towards achieving the **SDG targets**. The NSO has also identified other national statistics that can supplement the UN indicators and proxies with additional information relevant for a Maltese context. The results of these processes are reflected in the "[Sustainable Development in Malta: Statistical Information on the 2030 Agenda in Malta – 2021](#)". This publication collates all existing data related to Malta and presented them as statistics related to the monitoring of the Sustainable Development targets.

In June 2022, the NSO published a **publication on the [State of the Climate](#)** which included an analysis of Malta's climatic changes as recorded from 1952 to 2020.

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[1] Responses submitted separately and combined by the secretariat.

Ministry for the Environment

In recent years the Ministry for the Environment developed a number of tools especially related to **evaluation of measures to be adopted for mitigation of greenhouse gases** through the development of a Marginal Abatement Cost Curve (MACC) model, to ensure the best return on investment in adopted measures.

For adaptation, a methodology is being developed and applied for the **evaluation of climate change impacts on the economy** allowing for the identification of specific economic sectors which require the most urgent interventions in line with their importance in the economy and their adaptive capacity or lack thereof.

Malta Resources Authority - GHG Inventory Agency of Malta

The Malta Resources Authority (MRA) is the national **GHG Inventory Agency of Malta** and as such is responsible for the **compilation of annual national inventories of greenhouse gas emissions from sources and removals by sinks**, in accordance with requirements of the UNFCCC and of European Union law, and within the context of a national system for reporting of GHG inventories. In this respect, the key function of the MRA is the fulfilment of obligations pertaining to reporting and monitoring of compliance with relevant GHG emission commitments. Furthermore, the MRA is also responsible for compilation of **biennial reporting on policies and measures** and on **projections of GHG emissions and removals**.

Recent years have seen efforts by the MRA focussing on several key elements, including, among others:

- **Improving the quality of the national GHG inventory**, with the establishment of a documented quality management system, and achieving ISO certification of the GHG inventory processes of the MRA.
- Started the **integration of updated methodologies and calculation factors in accordance with the 2019 IPCC Refinements**, with a phased-in approach depending on the sectors concerned. This ensures that GHG emission statistics produced by the MRA are in accordance with the latest available and accepted scientific knowledge.
- Setting up a **data viewer** on the MRA website, with a first trial viewer already in place (https://mra.mt/climate-change/ghg-mitigation/), limited, at present, to historic (GHG inventory) emissions and removals data. The intention is that this feature will be developed further in future, to provide an interactive access to **key data on GHG emissions and removals, including also projections**, for various categories of audiences.

Key development plans

For the **air emission accounts**, NSO is planning to start publishing locally the annual data and also compiling the **quarterly air emission accounts** based on Eurostat methodology.

The Ministry for the Environment is developing the methodology related to **assessment of the impacts and vulnerabilities of the economy**, additionally methodologies for the ex-post evaluation and tracking of progress toward achievement of targets are to be developed in the coming years.

The Malta Resources Authority will continue the **development of the GHG reporting systems** in a manner that ensures that the reporting requirements incumbent on Malta, as a Party to the UNFCCC and as member of the EU, are fulfilled to the highest standard possible.

To this effect, key actions will include the continued phasing-in of the implementation of the **2019 IPCC Refinements** where applicable, and the adaptation of internal systems and outputs to cater for the developing reporting regime, particularly within the context of the **Paris Agreement**.

Furthermore, due consideration will be given to how GHG inventory data and data relating to projections can be made even more **accessible to the public**, through continued development of the **data viewer**, and other approaches, such as the publication of **infographics**.

Structurally, an aspect that the MRA is already looking at is the need to establish **a national system for reporting on policies and measures and on projections**. Though this will necessarily have to be a national effort, to the extent that the MRA remains responsible for the compilation of biennial reports, it will be a central player of such a national system. The MRA has already initiated analysis of potential approaches towards this goal. The objective here is not only to set up a system for the purposes of fulfilling obligations, but to have a system that facilitates the compilation of relevant **reporting**, ensures greater **coordination** between all relevant stakeholders, and provide a platform for the **dissemination** of data and information to a wider audience, also playing a part towards **awareness raising** and **better-informed policy making**.

Areas and examples of statistics produced

Examples of the climate change-related statistics produced in Malta by responding organizations:

- Physical Energy Flows Accounts, and Air Emission Accounts are compiled and transmitted to Eurostat, and available on Eurostat website.
- Submissions of Malta's national GHG inventories may be accessed at: https://unfccc.int/ghg-inventories-annex-i-parties/2022 .
- Malta's Low Carbon Development Strategy: https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf -
- Submission of reporting on policies and measures and on projections may be accessed on the European Environment Agency Reportnet system, for example: https://cdr.eionet.europa.eu/mt/eu/mmr/art04-13-14_lcds_pams_projections/ .
- Other data related to adaptation is yet unpublished and being developed. It will be expected to be finalised by end of 2023.

Climate change and environment in population and housing censuses

In the dwellings section of the 2021 Census questionnaire, there is one question which can be linked to the environment since it asks about the availability of certain facilities in the dwelling, such as:

- PV panels
- Solar water heater
- Well
- Water reverse osmosis

The full results of the Census 2021 are not yet available. For more information please visit: https://census2021.gov.mt/

Use of administrative microdata

For the purposes of estimating emissions relating to public electricity and heat production, the MRA uses data on fuel consumption in the **local electricity generation plants** derived from annual reports submitted by the operators of the respective plants falling with the scope of the **EU's emissions trading system**.

For the purposes of deriving **activity data relating to road transport**, the MRA makes use of data from the national system for the **registration of road vehicles** administered by the national transport authority.

In the case of estimating emissions relating to the use of F-gases as substitutes to ozone-depleting gases, data is obtained directly from **private sector enterprises**, on imports and placing on the market of F-gases.

In the case of data relating to **agriculture and LULUCF activities**, the data used is often derived from national statistics sources, such as **censuses and national surveys**.

In the case of the estimation of emissions from waste-related activities, the MRA utilises data provided by the **national regulatory authority for waste management**, with data being collected from regulated entities playing an active part in waste management in the country, especially information relating to volumes of waste reported by waste management entities.

Mexico

Keywords: National climate change statistics and indicators, Population and housing census, Coordination

Submitted by INEGI

Recent achievements
- National Information System on climate change (webpage)
- Technical Committee on information about climate change and emissions
- Indicators about assessment policies on climate change
- Key climate change indicators

INEGI does not produce impact data directly, but it can be assessed through the analysis of the information:

- Vegetation y Land Use Mapping
  https://www.inegi.org.mx/temas/usosuelo/#Descargas
- National Water Bodies Data Set:
  https://www.inegi.org.mx/temas/hidrologia/#Descargas
- Population data (Census): https://www.inegi.org.mx/temas/estructura/

Key development plans

Key development plans include:

- Redesign the National Information System on climate change and determine its governance
- Develop indicators and review the UN environment and UNECE indicators to promote their adoption in the country

- Develop two indicators: Mean Temperature Anomaly and Percentage of area with unusual conditions of temperature and precipitation

Areas and examples of statistics produced
The National Statistics and Geographic Information System through the Specialized Technical Committee in Climate Change are involved in developing some specific data about climate change (not mitigation or adaptation but about climate itself).

Climate change and environment in population and housing censuses
The recent population and housing census included some questions related to environment or climate change. More information is available at: https://censo2020.mx/resultados-por-tema-de-interes.html

Netherlands

Keywords: Drivers, Emissions, Impacts, Mitigation, Risk, impacts and adaptation, Solving data gaps, Water meter data, Gas meter data, Electricity meter data, Building energy ratings, Vehicle test data, Quarterly GHG emissions, Subnational GHG emissions, Increasing granularity and timeliness, SEEA, Ecosystem accounts, Carbon account, SDGs, European Green Deal, Linking climate, economy and society, Coordination, Expenditure, Users consultations, Analysis

Submitted by Statistics Netherlands

Recent achievements
- The **quarterly greenhouse gas emissions** estimates were implemented, both following the **IPCC and SEEA guidelines**. This also allows to make a first annual estimate 75 days after the end of the reference year. See our 16 March news release: Greenhouse gas emissions 2.1 percent higher in 2021 (cbs.nl).
- The national carbon footprint is published on an annual basis and work is ongoing improving this data using Multi Regional Input Output tables (MRIO). See at the bottom of our 9 February news release: Urgenda reduction target for GHG emissions achieved in 2020 (cbs.nl).
- We performed several **SEEA** analyses using climate change-related statistics, including **decomposition analysis and shift share analysis**.
- Work is ongoing to determine **energy related expenditure within the Dutch economy**, which includes **climate change mitigation expenditures**.
- The SEEA ecosystem accounts are being implemented, which include **condition accounts on ecosystem characteristics and ecosystem service accounts**.
- A **carbon account** was compiled using the guidelines of the SEEA EA. This provides a comprehensive overview of all national carbon flows between the geosphere, biosphere, atmosphere and the economy.

Key development plans
Statistics Netherlands focus in 2023 will be on:

- Launching annually a **Dutch statistical Green Deal Action Plan** on developing new statistical information, demand driven and taking into account also Eurostat's European Green Deal Action Plan.

- Enhancing our internal responsiveness and potential to meeting data demands, including the strengthening of producing **indicators crosscutting environment/climate and economics/social dimension**.
- Wide and in-depth **consultation on the data demand of key stakeholders** at the national and sub-national level, and of key international communities.
- Delivery of new indicators on the **impact of climate change and energy transition** on economic actors;
- **Strengthening co-operation** with other data-producers and research and science community.
- Developing a **Green Deal dashboard** which provides a broader storyline covering climate and weather changes; the impact on humans, economy and businesses; emissions and targets; and drivers and actions (mitigation/adaptation).
- Exploring the potential of a Dutch Green Deal data space.

Some activities were already started in 2022.

Areas and examples of statistics produced
Some examples from Statistics Netherlands:

- Disseminated in 2022: [Monitor of Well-being & the Sustainable Development Goals 2022 (cbs.nl)](#);
- Disseminated in 2022: [Ecosystems and wellbeing – the impact of land use changes (cbs.nl)](#);
- A general description: see [Natural Capital (cbs.nl)](#); includes also hyperlinks to other relevant work on the right side;
- Disseminated 28 October 2021, in cooperation with several other Dutch institutes: [Climate and Energy Outlook 2021 | PBL Netherlands Environmental Assessment Agency](#)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
Disseminated by Statistics Netherlands, in 2022:

- [Resilience - Monitor of Well-being & the Sustainable Development Goals 2022 | CBS](#)
- Another example, not from Statistics Netherlands: [Opportunity map Natural climate buffers - Klimaateffectatlas](#) and [Map narratives - Klimaateffectatlas](#).

Solving climate change-related data gaps
Statistics Netherlands' Green Deal Action Plan was started in 2022. The main part of the Green Deal activities (e.g., on data gaps) will be carried out in 2023 and later.

Improving granularity of climate change-related statistics
CBS produces:

- Quarterly GHG emission estimates, see: [Greenhouse gas emissions 2.1 percent higher in 2021 (cbs.nl)](#) and the methodology report: [Quarterly estimates of greenhouse gas emissions (cbs.nl)](#)
- Subnational GHG emission estimates, see GHG emissions (Total, CO2, CH4, N20) by municipality: [Waar worden broeikasgassen uitgestoten? (cbs.nl)](#) (in Dutch, but visualized on a map)

New Zealand

Keywords: Emissions, Solving data gaps, Population and housing census, Quarterly GHG emissions, Subnational GHG emissions, Other sub-annual or subnational CCRS, Increasing granularity and timeliness, Consumption-based emissions, SEEA, Environmental statistics, Dissemination

Submitted by Statistics New Zealand

Recent achievements
In the last few years, Stats NZ have developed several **environmental-economic accounts** relating to **emissions**. These include accounts for: **industry and household emissions on a production basis, both annual and quarterly; consumption-based emissions; tourism related emissions, and regional production-based emissions**. These are now released on a regular production cycle. Over the course of development (since 2018) we have gradually expanded the amount of information available in each account, e.g. through additional industry detail or gas breakdowns. Most recently, after five experimental releases and international peer review, the **quarterly emissions account was moved to the Stats NZ official calendar** in July 2022. Using the quarterly methodology also allows for provisional annual emissions statistics to be published approximately six months after the end of the year. These annual statistics are also being used to provide more up-to-date regional emissions which now have a lag of approximately 8 months as opposed to the previous lag of 21 months.

- Industry and households (annual) emissions (includes tourism emissions) https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-industry-and-household-year-ended-2020
- Industry and households (quarterly) emissions https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-industry-and-household-december-2021-quarter
- Consumption-based emissions https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-consumption-based-year-ended-2019
- Regional emissions: https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-y-region-industry-and-household-year-ended-2021/

Key development plans
The development phase for the emissions accounts is largely complete with future work focusing on **quality, maintenance, and enhancing use of the emissions data**. Stats NZ are also looking into adding **SEEA energy and material flow accounts** to our suite of environmental statistics to provide further insight into the relationship between emissions and the New Zealand economy.

Areas and examples of statistics produced
Stats NZ produce a range of emissions accounts but customer needs are often below published level, or for data on a different classification basis, or for accounts (e.g. regional consumption emissions) that are not feasible, or out of scope of SEEA (e.g. tourism emissions by passenger type). **Explaining the basis and interpretation of the accounts**, and the link to the GHG inventory, is an important part of **dissemination process**. For links and examples, see recent achievements section above.

Solving climate change-related data gaps
The recently developed accounts were particularly beneficial for filling data gaps relating to regional emissions and tourism emissions in New Zealand. While several NZ regions had undertaken their own GHG inventories, these were not regular or not produced for all regions, so the **regional emissions** series provides regular and complete insight into the regional distribution of emissions. The gap in regional emissions knowledge was bridged by linking the national level SEEA industry and household emissions account to region by industry data series.

Other analyses of the emissions data have helped fill further gaps, e.g. emissions by **firm size groups** and Māori emissions profile.

Climate change and environment in population and housing censuses
The Census (last undertaken in 2018) includes a question on main types of heating and fuel types used to heat dwellings. Further information is available from here:

- Main types of heating and fuel types used to heat dwellings (information about this variable and its quality) - Stats NZ DataInfo+

Improving granularity of climate change-related statistics
Stats NZ produces **quarterly production-based greenhouse gas emissions estimates for seven industries and households (by purpose) based on the SEEA,** and by gas type for broad industry groups. These are available from the March 2014 quarter onwards. https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-industry-and-household-december-2021-quarter

Stats NZ produces **production-based emissions data for 16 regions, with data for 12 industries and households** (by purpose) available for each region. These are available from 2007 and released with an approximate eight month time lag. Estimates for the final year are termed provisional. https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-by-region-industry-and-household-year-ended-2021/

The **environmental reporting at Stats NZ**, in conjunction with the Ministry for the Environment, also team produce climate indicators which contain sub-annual and sub-national elements. Atmosphere and climate | Stats NZ

Poland

Keywords: Emissions, Risk, impacts and adaptation, Population and housing census, Subnational GHG emissions, Increasing granularity and timeliness, Air pollution, SEEA, GHG inventory, Hydrometeorological data, SDGs, Energy statistics and energy balances, Linking climate, economy and society, Transport, Forests

Submitted by Statistics Poland

Recent achievements
In Poland, the **inventory of air pollutant emissions, including the inventory of greenhouse gases and other substances**, is made by the National Center for Emissions Management (KOBiZE-IOŚ), operating as the part of the Institute for Environmental Protection – National Research Institute (IEP-NRI).

Role of The National Centre for Emissions Management (KOBiZE) as GHG inventory compiler involves continuous improvement of **time series consistency and transparency** of GHG emission inventories. Increasing accuracy of activity data, emission factors and emissions used for estimates submitted to UNFCCC and EU.

Recently Statistics Poland enlarged area of cooperation with National Centre for Emissions Management (KOBiZE), with **collecting additional data** prepared exclusively for KOBiZE. The examples are:

- Preparation of **energy balances** with details necessary for elaboration Air Emissions Accounts (AEA) reported in Eurostat
- Preparation of additional statistical data improving national methodology of distribution of emissions from **road transport** within Air Emissions Accounts NACE categories;
- Cooperation with preparation of data for distribution of emissions at NUTS2 level which are published by Statistics Poland in the "Environment" yearbook.

Key development plans
Due to the fact that the issue of climate change is complex, concerning mutually influencing aspects – environmental, social and economic – its measurement is still a challenge for statistics, especially in the context of financial aspects. The key plan for the coming years is:

- Improvement of reporting for **non-ETS GHG emissions and F-gases**,
- Development of current **environmental economic accounts** (including air emissions accounts, physical energy flow accounts),
- Development of new environmental accounts planned for inclusion in the legal base (**subsidies and similar transfers, forest, ecosystem accounts**).

Areas and examples of statistics produced
Statistics Poland does not directly maintain a database on Climate Change-related statistics. Some indicators are presented in other sources:

- GHG emission changes at the national level as the one of the indicators describing Country Development Strategy are published by The National Centre for Emissions Management (KOBiZE) on their website. More information can be found:
  - GHG inventory results: https://unfccc.int/ghg-inventories-annex-i-parties/2022
  - Air pollutant inventory results: https://www.ceip.at/status-of-reporting-and-review-results/2022-submission
- Some of the Climate Change-related indicators are identical to the **sustainable development indicators** for which the Statistics Poland maintains a special database (https://sdg.gov.pl/en/)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
The **LIFE Climate CAKE - Project** concept has been developed at the National Centre for Emissions Management (KOBiZE), operating as the part of the Institute for Environmental Protection – National Research Institute (IEP-NRI) and its aim was to provide good quality analytical tools to assess the **climate policy impacts**, particularly for Poland with its unique **dependence on coal**. See more at https://climatecake.ios.edu.pl/?lang=en

Climate change and environment in population and housing censuses

Last population and housing census for year 2021 included number of questions related to environment and climate change that after aggregation and analysis became useful **input data for emission models**. Census 2021 collected information about heating system used in houses with focus on energy source used, including information about heat pumps, gas supply, use of renewable energy, etc.

Since 2021 Central Register Of Emissivity Of Buildings (CEEB) started to operate. National system of reporting covers type and power of heating sources including fuel used in the buildings. Reporting is obligatory for each house owner. It is expected that in 2023, after validation and analysis, this data will be useful input for climate related projects.

Improving granularity of climate change-related statistics

Statistics Poland publishes data and indicators related to climate change - both in publications and databases. These are data on air pollutant emissions and greenhouse gas emissions, meteorological data and indicators of sustainable development.

These data are available, among others in the publication "Environment" and the SDG database. Data on Air Emissions Accounts are available in the publication "Economic aspects of environmental protection".

Statistics Poland enlarged area of cooperation with National Centre for Emissions Management (KOBiZE). The cooperation consists in preparing **data for emission distribution at the NUTS2** level and publishing by the Statistics Poland in the yearbook "Environment".

Available sub-national climate change-related statistics concern:

- Compiling sub-national GHG emission inventory for 16 voivodships consistent with national level inventory.
- Compiling inventory for environmental accounting project transforming GHG emission data from IPCC to NACE categories (Eurostat NAMEA project).

Improvement of timeliness, frequency and granularity is continuous and multi-thread process. Two inventory teams are working with annual GHG and air pollutants emission inventories. Each year emission inventories are being reviewed providing new feedback and conclusions.

Russian Federation

Submitted by Rosstat[2]

Recent achievements

Rosstat:
- Works on improvement of the system of **statistical indicators** and development of new indicators to calculate of anthropogenic greenhouse gas emissions,

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[22] Response submitted in Russian; this is unofficial translation.

- Participates in implementation of the **national action plan on adaptation to climate change**
- Publishes **climate change indicators**
- Develops and publishes information on **environmental taxes**, based on which the indicator "Energy and transport taxes and their share in total environmental taxes" is calculated.

Key development plans

Development of official statistical information in accordance with the Federal Statistical Work Plan to provide estimates of anthropogenic greenhouse gas emissions.

Areas and examples of statistics produced

- Indicator "**Total energy consumption**" - Estimated from the Energy and Fuel Balance Short Calculation Document (not published). The Summary Estimated Fuel and Energy Balance is available on the Rosstat website at: Home / Official Statistics / Business / Industrial Production / Energy Balance of the Russian Federation or at https://rosstat.gov.ru/enterprise_industrial.
- Indicator "**Share of fossil fuels in total primary energy supply (TPES)**"- Estimated based on the Short Fuel and Energy Balance Estimated (not published). The Short Estimated Fuel and Energy Balance is available on the Rosstat website at: Home / Official Statistics / Business / Industrial Production / Energy Balance of the Russian Federation or at https://rosstat.gov.ru/enterprise_industrial.
- Indicator "**Energy intensity of Gross Domestic Product (GDP)** for the year preceding the previous year" - The indicator is posted on Rosstat's website at: Home / Official Statistics / Technological Development of Economic Sectors / Energy Efficiency / Energy Intensity of GDP (GRP) or at https://rosstat.gov.ru/folder/11189 .
- Indicator "**Share of electricity produced using renewable energy sources in total electricity production**" - The indicator is posted on the Rosstat website at: Home / Official statistics / Technological development of economic sectors / Energy efficiency / Production, consumption of electricity and capacity of power plants. Electricity production of employees of industrial organisations or at https://rosstat.gov.ru/folder/11189 .
- Indicator "**Total energy resources consumption**" at: https://rosstat.gov.ru/enterprise_industrial
- Indicator "**Total energy intensity of GDP**" at: https://rosstat.gov.ru/storage/mediabank/energo.xlsx
- Indicator: "**Water stress level: freshwater abstraction as a share of available freshwater resources**" at https://fedstat.ru/indicator/60937 .
- Indicator "**Share of energy and transport-related taxes in total taxes and social contributions**" at https://rosstat.gov.ru/storage/mediabank/itogi_form-schet.pdf

Solving climate change-related data gaps

Rosstat has set up and published an Environmental Tax Account, which is used to calculate the indicator "Energy and Transport Taxes and Their Share in Total Environmental Taxes".

Climate change and environment in population and housing censuses

The All-Russia Population Census 2020 was taken as of 01.10.2021. During the census the living conditions of the population were examined, including the types of housing amenities and sanitary and hygienic living conditions. Sample census forms are available on the official website of the Federal State Statistics Service https://rosstat.gov.ru/ in section Statistics → Censuses and Surveys → Population Censuses → All-Russian Population Census 2020. The results of the 2020 All-Russian Population Census on the living conditions of the population will be published in December of this year.

Serbia

Keywords: Impacts, Mitigation, Adaptation, Population and housing census, Emissions, SEEA, SDGs

Submitted by Statistical Office of the Republic of Serbia

Recent achievements

Serbia is a candidate country for EU membership and in recent years, a lot of work has been done on the implementation of the European acquis.

At the end of 2021, the Statistical Office of the Republic of Serbia (SORS) implemented EU Regulation 691/2011 on **European environmental economic accounts**. All six accounts of this Regulation are important for the climate change-related statistics and used for calculation of a large number of indicators: https://publikacije.stat.gov.rs/G2021/PdfE/G20216004.pdf

In addition, the Statistical Office of the Republic of Serbia is in charge of monitoring and publishing indicators of **Sustainable Development Goals** (SDG). Several indicators of the Sustainable Development Goals are also climate change-related indicators.

Users can access the SDG portal on the SORS website through which they can monitor the availability of indicators and download them for their needs. https://sdg.indikatori.rs/en-US/

Both of the mentioned facts represent a good basis for further work and planning activities on providing **new climate change-related indicators** and finding the best options for their presentation and publication.

Areas and examples of statistics produced

Statistical Office of the Republic of Serbia currently produces **several climate change-related indicators,** which are on the list of indicators of sustainable development goals (6.4.1 Change in water-use efficiency over time; 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources; 7.2.1 Share of renewable energy in gross final energy consumption).

In Statistical Office of the Republic of Serbia, there is no separate portal dedicated to climate change statistics, but the mentioned indicators are published on the **SDG portal**, for which SORS is in charge (https://sdg.indikatori.rs/en-US/)

Climate change and environment in population and housing censuses
Census of Population, Households and Dwellings in the Republic of Serbia will be held from 1 to October 31, 2022. The Questionnaire for Households and Dwellings included two questions related to environment and climate change: question 17 is about **Installation** in dwelling (electricity, water supply system, sewerage, gas pipeline and central heating) and question 18 is about Type of energy used for **dwelling heating**.

The content of the Questionnaire for Households and Dwellings can be viewed via the link below: https://popis2022.stat.gov.rs/media/31011/016a-p2-engleski.pdf

Improving granularity of climate change-related statistics
SORS implemented **Air emissions accounts** but data for greenhouse gasses is not available every year although the Environmental Protection Agency makes calculations every year. The reason is the by-laws in this area. The situation is changing because the **Law on Climate Change** was adopted in March 2021. Regular reporting on greenhouse gas emissions will be possible when new by-laws are adopted (the entire Inventory, the accompanying National Report, as well as all other reports provided for by the by-laws). After that, SORS will also be able to produce some GHG emissions estimates.

Slovenia

Keywords: Drivers, Emissions, Mitigation, Solving data gaps, Water meter data, Electricity meter data, Other sub-annual or subnational CCRS, National climate change statistics and indicators, Global Set of Climate Change Indicators and Statistics, CES Set of Core Climate Change-Related Statistics and Indicators, Energy statistics and energy balances, Water

Submitted by Statistical Office of the Republic of Slovenia (SURS)

Recent achievements
In March 2020, SURS participated in the implementation of the pilot task, which was led by UNSD. The **draft set of climate change statistics and indicators** included 171 indicators divided into five sections (Drivers, Impacts, Vulnerability, Mitigation and Adaptation).

From 2020, SURS also participates in expert meetings of the UNSD within the framework of the expert group for environmental statistics (EGES), one of whose main tasks is the establishment of climate change statistics and indicators.

This year SURS started activities to develop **a set of climate change indicators for Slovenia**. We reviewed both sets (UNSD and CES) of climate change indicators and started looking for potential data sources. Currently, we are analysing the accessibility and quality of data sources and based on the findings the draft set of indicators will be prepared.

Key development plans
In the following years, **SURS will experimentally publish a set of climate change-related indicators on its website**. In close cooperation with other national institutions, SURS will continue to search for missing data sources for the preparation of other climate change indicators. Afterward, also possible upgrade of other climate change-related statistics will follow.

Areas and examples of statistics produced

As mentioned above, SURS is in the phase of development of climate change-related indicators. According to current plans, the first experimental online publish (on the SiStat database) of climate change-related indicators is expected in the end 2023.

Use of administrative microdata

SURS uses water meter data and electricity meter data to produce climate change-related statistics. Water meter data are collected by administrative source and later in the statistical process used for producing **water statistics**, and electricity meter data for **energy statistics**.

Improving granularity of climate change-related statistics

Other sub-annual or subnational climate change-related statistics produced by SURS include: NAMEA - Air Emissions Accounts. Some of the SURS data are already available annually, others also monthly or quarterly (energy statistics).

South Africa

Keywords: Drivers, Emissions, Impacts, Mitigation, Adaptation, Risk, impacts and adaptation, Solving data gaps, Population and housing census, Subnational statistics on climate impacts or adaptation actions, Other sub-annual or subnational CCRS, Increasing granularity and timeliness, SEEA, Carbon account, GHG inventory, National climate change statistics and indicators, Hazardous events, Loss and damage, Climate response, Health

Submitted jointly by Department of Forestry Fisheries and the Environment (DFFE) & Statistics South Africa (Stats SA)

Recent achievements
- Updating and developing a new suite of **indicators on climate change mitigation and adaptation**. The indicators inform domestic annual climate change reporting through the **Annual Climate Change Tracking Report**. The fourth report is due for publication and will be posted on the link below, end of August/September. https://www.dffe.gov.za/documents/other#
- Periodic compilation of South Africa's Greenhouse Gas National Inventory Report (NIR). The 7th **National Greenhouse Gas Inventory Report** (2000-2017) can be access from the link: https://www.dffe.gov.za/mediarelease/creecy_greenhouse-gas-inventory_report. The 8th National GHG inventory Report (2000-2020) will be finalised by December 2022.

Key development plans
- Developing **new indicators, online tools, setting up and strengthening institutional arrangements** for data collection (at DFFE).
- Implementation of other GHG improvement programs (GHGIP) such as a study to develop **CO2 emission factors for commonly used solid fuels**. This will also enhance emission estimates from the Energy sector (at DFFE).
- Implementation of South Africa's GHG Emissions Reporting Verification programme as mandated through South Africa's Technical Guidelines for the Validation and Verification of GHG Emissions (at DFFE).

- Internal paper: Currently Statistics South Africa (Stats SA) decided to do a **feasibility study on selected carbon and GHG emission**s to identify if Statistics SA can publish GHG and carbon accounts as part of the Natural Capital Accounting (NCA) series. Statistic South Africa has a broad process for developing Greenhouse gases and carbon emission as part of Natural Capital Accounting (NCA) the process of feasibility phase, second sources and methods of the study, reporting phase and publication phase.

Areas and examples of statistics produced
See also the Local Government Climate Change Support Program: https://letsrespondtoolkit.org/

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
- Green book – a downscaled platform that highlights various **vulnerabilities of municipalities to climate variables**. https://greenbook.co.za/
- **Coastal vulnerability assessment tool**: https://mapservice.environment.gov.za/coastal%20viewer/
- The **vulnerability assessments for 27 major tourists sites** across the country (hardcopy report).
- The **vulnerability assessments for the health sector** (hardcopy report).
- The **provincial and municipal vulnerability and response strategies** (hardcopy report).

Plans underway:

- **Sector-specific climate change indicators** (to be hosted in the monitoring and evaluation system NCCIS https://ccis.environment.gov.za/#/
- Collect data on the **loss and damage resulting from extreme events**. These project is crucial to unlock collaboration with insurance industries/association but also build a case for technical discourse on **the quantifiable loses** that are associated with extreme events in the country (burning issue in the global discourse).
- Downscaling the climate systems to **a provincial level**, this initiative is meant to support province them on **M&E for adaptation** through the development of systems at provincial level but also enhancing climate change information management at national level; for example, the Climate Change Response Database of Mpumalanga Province: https://mccrd.environment.gov.za

Solving climate change-related data gaps
South Africa recently developed Tier 2 CO_2 emission factors from the commonly used liquid and gas fuels in the country

Another data gap, which is currently being addresses is access to **climate response data** from stakeholders. Bilateral engagements with data custodians are in progress.

Climate change and environment in population and housing censuses
Both the General Household Survey (GHS) and Census 2011 questionnaires contain questions that measure the prevalence of climate change inducing events.

Examples of such questions:

- WAT1: What is the household's main source of drinking water?
- SAN1: What type of toilet facility is used by this household?

- ENG1: Does this household have access to, or use electricity?
- ENG5: What is the main source of energy/fuel for cooking in this household?
- ENG 8: What is the main source of energy/fuel for space heating in this household?
- SWR3: Which of the following environmental problems do you experience in your community/neighbouring farms?
    - Irregular or no waste removal;
    - Littering;
    - Water pollution; and
    - Outdoor/indoor air pollution
    - Land degradation / over-utilization of natural resources.

Web links to publications:

- GHS: https://www.statssa.gov.za/?page_id=1854&PPN=P0318&SCH=73293
- Census 2011: https://www.statssa.gov.za/?s=Census+2011+&sitem=publications

Improving granularity of climate change-related statistics
In South Africa, **subnational statistics on climate impacts or adaptation actions** and **other sub-annual or subnational climate change-related statistics** are produced. Description is available at following web page: https://nccrd.environment.gov.za/

South Africa has a GHG Management System that includes a 2 year timeline for the compilation and publication of NIRs. This system and cycle assists South Africa to plan accordingly and prepare for NIR in accordance with the timelines.

The two year inventory cycle is maintained by the National GHG Reporting Regulations that require relevant stakeholders to submit activity data annually.

Sweden

Keywords: Drivers, Emissions, Mitigation, Risk, impacts and adaptation, Solving data gaps, Vehicle test data, Quarterly GHG emissions, Subnational GHG emissions, Other sub-annual or subnational CCRS, Increasing granularity and timeliness, Consumption-based emissions, Ecosystem accounts, National climate change statistics and indicators, SDGs, Environmental taxes and subsidies, Fossil fuel subsidies, Waste, Circular economy

Submitted by Statistics Sweden

Recent achievements
Statistics Sweden works continually on improving the quality of statistics on climate change-related statistics in many areas. A few highlight include:

- Suite of **climate change-related statistics** in Agenda 2030
- **Territorial greenhouse gas emissions** (over 100 development projects in the past few years)
- **Quarterly emissions statistics**
- Official statistics on **consumption-based emissions**
- **Environmental taxes**
- **Environmental goods and services**
- **Fossil fuel subsidies**

All these can be found on the environmental accounts homepage and on SCB's homepage.

Key development plans
- **Consumption-based emissions** - An official target for reducing them has been proposed and the statistics will be developed in line with this plan.
- **Fossil fuel subsidies**
- **Ecosystem accounts** - e.g. extent, condition, services
- **Circular economy**
- Territorial emissions
- **Waste statistics** (e.g. reduced plastic use, and emissions effects thereby arising)

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
- https://www.scb.se/en/finding-statistics/statistics-by-subject-area/environment/environmental-accounts-and-sustainable-development/sustainable-development-indicators/
- https://www.scb.se/hitta-statistik/temaomraden/agenda-2030/

Use of administrative microdata
Statistics Sweden uses **vehicle test data, taxation database** from Swedish tax authority (Skatteverket), **statistical business register** (FDB), **Swedish chemicals agency data** to produce climate change-related statistics. Examples of uses are listed below:

- Vehicle data for calculation of emissions, including per region
- Taxation database for fossil fuel subsidies, env taxes
- Statistical business register - environmental goods and services, reginal emissions

Improving granularity of climate change-related statistics
Statistics Sweden produces quarterly GHG emission estimates, subnational GHG emission estimates and other sub-annual or subnational climate change-related statistics.

Links to quarterly greenhouse gas emissions statistics, land accounts and environmental goods and services can be found above. Additional steps to improve timeliness and granularity of climate change-related statistics include:

- Quarterly emissions statistics
- Project on timeliness for consumption-based emissions
- Preliminary yearly statistics
- **Environmental indicators for building and real estate sectors**
- **Digitalization of information from companies' obligatory environmental reports**

Switzerland

Keywords: Drivers, Emissions, Impacts, Mitigation, Solving data gaps, Population and housing census, Other sub-annual or subnational CCRS, Increasing granularity and timeliness, SEEA, Ecosystem accounts, National climate change statistics and indicators, Carbon footprint, Linking climate, economy and society, Forests

Submitted by the Swiss Federal Statistical Office (FSO)

Recent achievements
In July 2019, the Swiss Federal Statistical Office FSO published a set of around 20 **climate-related indicators** on its website. The indicators are available in French and German and can be viewed under the link: https://www.bfs.admin.ch/bfs/fr/home/statistiques/espace-environnement/indicateurs-lies-au-climat.html

The aim of this project is to provide a **simple and rapid overview of the topic**, based on reliable statistical information, and moreover to provide an entry point to access further information and data on the subject. The indicators are divided into three domains, which also determine the storytelling: Human impacts > Observed changes > Reactions from Society

Some of the information found in the climate-related indicators originates from the environmental accounting, which is compiled by the FSO according to Eurostat guidelines. https://www.bfs.admin.ch/bfs/en/home/statistics/territory-environment/environmental-accounting.html

Key development plans
At least at three different times during the year, we update the climate related indicators with new data that has become available. Moreover, we follow the current developments in this area: for example, if new statistics or indicators emerge, they will be considered for the set.

The environmental accounting is also being further developed and refined. For example, we are working on a new methodology for calculating the greenhouse gas footprint and earlier this year, we released a publication on climate impacts of Swiss households (https://www.bfs.admin.ch/asset/en/21564115).

In the context of ecosystem accounting, we are conducting a feasibility study investigating the ecosystem service carbon sequestration for all Swiss ecosystems as well as forest ecosystem services of Swiss forests starting this year up to 2024.

Solving climate change-related data gaps
The thematic account for the ecosystem service carbon sequestration, which is part of the feasibility study on ecosystem accounting, should solve outstanding climate-change related data gaps. This work is in progress and results are not available yet.

Climate change and environment in population and housing censuses
There's a module on "**Environmental Quality and Behaviour**" within the Swiss population census, which also contains questions on climate change. This survey has been conducted every 4 years since 2011, with the next one planned for 2023.

The **Federal Register of Buildings and Dwellings** (RBD), which is continuously updated by communal building departments, contains some energy-related attributes.

Improving granularity of climate change-related statistics

Ecosystem accounts and the inter-annual change matrix are part of the feasibility study on ecosystem accounting and are on a sub-national scale.

Moreover, **granularity** of the economic branches for air emission accounts (AEA), physical energy flow accounts (PEFA) and environmental taxes accounts (TAX) was improved and **timeliness** for TAX was improved by 6 months.

Ukraine

Keywords: Drivers, Emissions, Solving data gaps, Energy statistics and energy balances

Submitted by State Statistics Service of Ukraine

Recent achievements
- Calculations of the greenhouse gas emissions in the national Air Emissions Account for 2016-2019 were made based on the data of the national inventory of greenhouse gas emissions, provided by the country to the UNFCCC and is used to produce statistics related to climate change. See the results at the following link: http://ukrstat.gov.ua/operativ/operativ2018/ns/er_oap/arh_er_oap_u.htm
- Production and publication of energy balance on a regular basis: http://ukrstat.gov.ua/operativ/operativ2012/energ/en_bal/arh_2012.htm

Areas and examples of statistics produced
The State Statistics Service produces several statistical indicators related to emissions and drivers of climate change:

- **Energy balance** of Ukraine (product) for 2019 http://www.ukrstat.gov.ua/operativ/operativ2019/energ/En_bal/Bal_2019_ue.xls
- **Energy intensity** for 2007-2019: http://www.ukrstat.gov.ua/operativ/operativ2020/energ/energoemn/enem_ue.xls
- The share of **energy supply from renewable sources** for 2007-2019: http://www.ukrstat.gov.ua/operativ/operativ2020/energ/energospog/esp_vg_ue.xls
- **CO2 emissions** from fuel combustion attributable to the national economy
- CO2, CO2_Bio, N2O, CH4, HFCs, SF6 emissions from households in Air emissions account 2016-2019 http://www.ukrstat.gov.ua/operativ/operativ2018/ns/er_oap/er_oap_2018_eu.xlsx

United Kingdom

Keywords: Drivers, Emissions, Impacts, Mitigation, Adaptation, Risk, impacts and adaptation, Solving data gaps, Building energy ratings, Quarterly GHG emissions, Subnational GHG emissions, Increasing granularity and timeliness, Hydrometeorological data, National climate change statistics and indicators, Dissemination, Public opinion, Linking climate, economy and society, Transport, Coordination, Users consultations, Health, Analysis

Submitted by the Office for National Statistics

Recent achievements

Working across the UK government, Office for National Statistics created the prototype **UK climate change statistics portal** (https://climate-change.data.gov.uk/), bringing climate change-related information together for the first time, in time for COP26. This has 6 pillars, including **emissions, drivers, impacts, mitigation and adaptation**. ONS plans to launch a refreshed design with more interactive content in Autumn 2022 ahead of COP27 that will continue to develop as we identify and include new datasets and content.

Following a recommendation from the UK official statistics regulation (OSR), we developed a new publication, **Climate Change Insights**. The first edition was published in May alongside the first quarterly Gross Domestic Product estimate. This brings together a range of climate change-related statistics quarterly basis, including changing **weather trends** as well as **emissions**, **drivers** and **mitigation**, **impacts** and **adaptation** and a section on **behaviours** and **actions** around moving towards net zero. This insights publication brings greater **coherence** to the range of statistics available, mostly already-published official government statistics (by the ONS, other government departments, devolved administrations and/or NGOs). From the second edition we have adopted a themed approach to support this, starting with 'families and households' in August. Future themes under consideration include: '**natural and rural environments**'; '**economy and transport**'; and '**health and the health sector**'.

Following parliamentary interest, we are developing new quarterly estimates of greenhouse gas emissions on a residency basis. A framework for this was proposed in May and first estimates are expected by the end of 2022. ONS is engaging with other NSOs and international bodies on this work.

Our Insights and new quarterly emissions statistics are also an integral part of ONS' 'GDP and beyond' work. August's Insights was published alongside an update of the national well-being dashboard and a quarterly wellbeing publication, both alongside and supplementing economic statistics (GDP). This provides a more holistic understanding of the UK economy, society and the environment as well as measuring progress, as outlined in our recent blog.

Key development plans

The priority for the Climate Change Statistics Portal is the launch of the new refreshed design in September.

This will be followed by a update and review of existing indicators (adding the UK Net Zero Strategy and others) in the underlying framework with an addition of new datasets to the portal. As part of this on-going work, ONS will also continue to develop the functionality and capability of the portal to support interactive and novel content.

Further into the future, work on providing a greater level of **granularit**y to datasets will be the longer-term goal to allow for **regional comparisons** where possible.

Further development of Climate Change Insights will follow **feedback and engagement with data providers, users and the public**.

ONS also plans to supplement Insights with ad hoc additional **analysis** supporting user needs around climate change, e.g. a timely response to current or emerging event, developing new insight and/or filling identified gaps.

As ONS expands its team and demand for analysis continues to increase, they will continue **work collaboratively with other government departments**, devolved administrations and others.

ONS will also look to develop quarterly GHG emissions estimates, e.g. reducing time lag between the point of emission and reporting of it.

Areas and examples of statistics produced
The UK Climate Change Statistics Portal and ONS Climate change insights bring together a range of climate-change related statistics - including in the above categories. In addition to this:

- **Emissions**: Our Environmental Accounts provide GHG emissions on a residency basis, comparable with the national accounts. We hope to publish quarterly estimates by the end of 2022.
  Impacts: Health teams in ONS are developing work on health and climate change, with a focus on human health. See here for an example of a piece in response to the recent heatwaves Do summer heatwaves lead to an increase in deaths? - Office for National Statistics.
- **Adaptation**: working with lead departments on potential indicators.

 We run **regular (fortnightly) surveys of both the public** (via our Opinions and Lifestyle Survey (OPN)) and **business** (via our Business Insights and Conditions Surveys (BICS)) to capture **attitudes to climate change** (as well as many other topics). We have included outcomes of climate change related questions on perceptions of climate change in both the May and August releases of our Insights publication. There are also relevant questions on both surveys that are reported in other publications (for example of a recent survey asking about climate change and the recent heatwave Public opinions and social trends, Great Britain),
There is a set of questions scheduled for September and October that will focus on **impacts and actions taken as a result of climate change**, and we are currently developed questions for a focused 'module' on both OPN and BICS to look at impacts, attitudes and actions in the climate change space later in the year.

Statistical activities related to measuring climate risk, impacts and adaptation or resilience
Data on climate change impacts and adaptation were included in:

- Climate Change Insights releases in May and August:
- April BICS figures on businesses that assess climate risks – ONS is also looking at asking businesses in more detail about their climate risk assessments via BICS

Opportunities to develop work in this area will be identified through the developing Climate Change Insights publication and related work.

Solving climate change-related data gaps
Recently solved data gaps included data on **businesses with various climate and nature-related strategies in place** (April BICS).

There is also ongoing work on quarterly GHG emissions estimates (residency basis), which are expected by end 2022.

Use of administrative microdata
ONS uses **building energy ratings** to produce climate change-related statistics – Energy Performance Certificate data (for England & Wales) – for statistical outputs. ONS is generally interested in using **microdata**, such as electricity meter and vehicle test data, but it is too early in this work to outline obstacles.

Improving granularity of climate change-related statistics
Sub-annual GHG emission estimates:

- Climate Change Insights is published quarterly. ONS is developing options for including both sub-national and sub-annual statistics in this publication
- In progress: quarterly GHG estimates for the UK (residency basis) by end 2022

Subnational GHG emission estimates:

- BEIS produce local authority level GHG estimates (which was included in the latest CC Insights)
- UK national-level statistics for Low Carbon and Renewable Energy Economy jobs

The following additional steps are taken to increase timeliness and granularity:

- ONS is looking to produce some **sub-national breakdowns from the rapid surveys** by combining multiple waves of data. The collection of questions to be asked in September and October of this year will allow for this (as well as other breakdowns including gender, age and potentially additional equality groups and/or socioeconomic groups)
- Exploring regional estimates of activity in the low carbon and renewable energy economy for the UK and regions of England.

Generally, ONS is looking to increase both **granularity**, in particular **spatial** and potentially for various characteristics, and **timeliness** but climate change statistics often depend on other statistics which themselves take time to assemble.

4. INTERNATIONAL UPDATES

United Nations Statistics Division

Keywords: Global Set of Climate Change Statistics and Indicators

Recent achievements

UNSD in close collaboration with UNFCCC and the Expert Group on Environment Statistics prepared a Global Set of Climate Change Statistics and Indicators. The Global Set was adopted at the fifty-third session of the United Nations Statistical Commission in March 2022 as the framework for climate change statistics and indicators to be used by countries when preparing their own sets of climate change statistics and indicators according to their individual concerns, priorities and resources. See decision 53/116, Climate Change Statistics, in the Final Report. More information on the recent developments, planned activities and a brief description of the Global Set are included in the Report of the Secretary-General to the 53rd session of the Statistical Commission. This report is translated into the six UN languages and it contains Annex II listing all the indicators (also translated). The full description of the Global Set and its metadata is included in the Background document to the Report of the Secretary-General, entitled Global Set and metadata.

Key development plans

To put the Global Set to work, UNSD proposed a list of activities included in section V of the Report of the Secretary-General on Climate Change Statistics to the 53rd Session of the Statistical Commission. They require three main priorities of further work as described in para. 33 of the report: (a) to encourage the implementation of the global set of climate change statistics and indicators in countries; (b) to further develop the methodology and contribute towards enhanced complementarity between global, regional and national initiatives; and (c) to enhance the coordination of capacity development and resource mobilization. The Statistical Commission approved the proposed workplan and the detailed activities (paras. 35-38 in the report to the Commission) which will be discussed at the next meeting of the EGES (25-28 October 2022, virtual) and an update will be provided to the Statistical Commission in two to three years.

KEYWORD INDEX

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