

How to reach the public with climate change-related statistics? Lessons learned from interviews with journalists in the UNECE region

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The paper is a draft chapter from the Guidance on the role of national statistical offices in achieving national climate objectives being prepared by the Task Force. The chapter has been developed by a dedicated subgroup of the Task Force consisting of Haykanush Azizyan (Ministry of Environment of Armenia), Emil Mammadov (State Statistical Committee of the Republic of Azerbaijan), Otto Swertz (Statistics Netherlands), Angela Watkins (Office for National Statistics of the United Kingdom), Arturo de la Fuente (Eurostat) and Malgorzata Cwiek (UNECE) under the leadership of Sara Svantesson (Statistics Denmark). A draft of the whole Guidance will be shared on the [webpage](#) of the UNECE Expert Forum for Users and Producers of Climate Change-Related Statistics in August 2023.

Abstract

Increasing public interest in a broad range of climate change-related issues, including emissions and mitigation / net zero policies, impacts on communities and the environment, the increasing need and benefit of adaptation and links with other topics such as the economy, health, transport and policy, brings new and emerging user groups of climate change-related statistics. Preferences of these user groups differ in terms of communication products, channels and data dissemination. The role of national statistical offices (NSOs) in informing the public about statistics and data relating to climate change ties in with the principles of Action for Climate Empowerment in the Paris Agreement and the Fundamental Principles of Official Statistics.

As part of the work of the UNECE Task Force on the role of national statistical offices in achieving national climate objectives, we have conducted structured interviews with journalists working on climate change-related issues from various media outlets across the UNECE region to understand how they work with various data sources, which statistics are most interesting for the public and what makes it easy or difficult for the journalists to use specific data sources. The results reveal that the public is interested in in-depth stories and insight-driven graphics on various climate change topics spanning environmental, social and economic issues. However, there are significant gaps in data availability, particularly on the impacts of climate change, its interactions with health, the economy and nature, and adaptation. There are also broader difficulties with the level of granularity and accessibility of data.

The presentation would cover lessons learned from the interviews and draft guidance on the role of NSOs in informing the public about climate change-related issues developed by the Task Force based on the interviews and country examples. The guidance covers dissemination and communication of climate change-related statistics, understanding user groups, actively reaching out to the public, using social media and other channels, working with machine searchability and coordination between statistical experts and communications staff within the NSO. The Expert Meeting participants will be invited to provide feedback and additional country examples.

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1 Introduction

1. The purpose of the chapter is to cover aspects of the role of national statistical offices in informing the public about climate change-related statistics and data.

2. The first section describes the policy context for NSOs informing the public about climate change-related statistics, departing from the concept of action for climate empowerment. The second section provides a schematic overview of user groups of climate change-related statistics and different user needs that the NSO can consider when publishing statistical products relating to climate change. The third section presents and analyses the results of a set of structured interviews with journalists conducted by the members of the Task Force. Experiences from the journalists include which statistics are most interesting and which are the most difficult to access. The fourth section on how the NSOs can contribute, covers the role of NSOs as well as examples of statistics, dissemination and organization in the NSOs. Conclusions are based on the results of the structured interviews as well as country examples collected by the Task Force.

2 Context and definitions

2.1 Policy context

3. The United Nations Framework Convention on Climate Change, the Paris Agreement and the 2030 Agenda for Sustainable Development all recognize that their goals cannot be achieved without involving all levels and sectors of government, but also the private sector, civil society and the public. The governments have agreed, special efforts to educate, empower, and engage all the stakeholders are needed that to enable this public participation. This is expressed in Article 6 of the Convention and Article 12 of the Paris Agreement, presented in Box 1, and referred to as “Action for Climate Empowerment” (ACE).

Box 1. Action for Climate Empowerment in the United Nations Framework Convention on Climate Change and the Paris Agreement

Article 6 of the Convention

In carrying out their commitments under Article 4, paragraph 1 (i), the Parties shall:

- (a) Promote and facilitate at the national and, as appropriate, subregional and regional levels, and in accordance with national laws and regulations, and within their respective capacities:
 - (i) The development and implementation of educational and public awareness programmes on climate change and its effects;
 - (ii) Public access to information on climate change and its effects;
 - (iii) Public participation in addressing climate change and its effects and developing adequate responses; and
 - (iv) Training of scientific, technical and managerial personnel;
- (b) Cooperate in and promote, at the international level, and, where appropriate, using existing bodies:
 - (i) The development and exchange of educational and public awareness material on climate change and its effects; and
 - (ii) The development and implementation of education and training programmes, including the strengthening of national institutions and the exchange or secondment of personnel to train experts in this field, in particular for developing countries.

Article 12 of the Paris Agreement

Parties shall cooperate in taking measures, as appropriate, to enhance climate change education, training, public awareness, public participation and public access to information, recognizing the importance of these steps with respect to enhancing actions under this Agreement.

4. ACE advocates that all citizens must be empowered to take individual climate action. In order to do so, they need to be sufficiently informed. Therefore, improving public outreach, education and awareness of climate issues will be crucial for the transition to a low-emission, climate-resilient world.

5. At the 11th Conference of the Parties in Doha, the governments adopted the Doha Work Programme¹, which provides guidance on how countries should implement ACE. The Doha Work Programme recommends a long-term, strategic and country-driven approach, including integrating relevant activities into existing climate change adaptation and mitigation programmes and strategies. Each country has also been requested to nominate a National Focal Point to coordinate these efforts.²

6. Based on the UN Framework Convention and the Paris Agreement, ACE is considered to have six main aspects:

- Education
- Training
- Public awareness
- Public access to information
- Public participation
- International cooperation

7. The objectives of each aspect are presented in Figure 1.

Figure 1. Article 6 elements - scope and objectives

Figure 1 • Article 6 elements - scope and objectives

Scope	Objectives	
Education	Change habits in the long-term	Foster a better understanding of, and ability, to address climate change and its effects
Training	Develop practical skills	
Public Awareness	Reach people of all ages and walks of life	Promote community engagement, creativity and knowledge in finding climate change solutions
Public Access to information	Make information freely available	
Public Participation	Involve all stakeholders in decision-making and implementation	Engage all stakeholders in debate and partnership to respond collectively to climate change
International Cooperation	Strengthen cooperation, joint efforts and knowledge exchange	

(Source: Adapted with permission from UNFCCC, 2005)

Source: UNFCC and UNESCO *Guidelines for accelerating solutions through education, training and awareness-raising* (2016)

¹ <https://unfccc.int/resource/docs/2012/sbi/eng/l47.pdf>

² An up-to-date list of national ACE focal points is available at the UNFCCC web page: <https://unfccc.int/topics/education-youth/national-ace-focal-points>

8. In the context of official statistics, the two key ACE elements are **public awareness** and **public access to information**, which both aim to share information and knowledge with the public to eventually support and enable public participation in climate action.³

9. Public awareness initiatives aim to improve understanding of climate change, which is expected to impact attitudes, behaviours and choices. The media is considered one of the most important communication methods and will include television, radio, print and social media. These can be used to spread and disseminate information on the causes and effects of climate change as well as meaningful and practical solutions⁴.

10. Actions aimed at improving **public access to information** aim to make information freely available, transparent and accessible. Improving access to information involves not only disseminating information but also supporting or creating mechanisms that help share the knowledge across sectors and communities, and between decision-makers at all levels, practitioners and citizens. Information, including data and statistics, is needed to understand, address and respond to climate change, including information on climate change initiatives, policies and results of actions.⁵

Did you know?

Publishing official environmental statistics is one of the examples of implementation of Action for Climate Empowerment in the area of Public Access to Information reported by the countries in their national contributions.

11. In order to contribute to the key ACE elements, NSOs need to communicate and disseminate data and statistics to a number of different audiences and in turn, be responsive to user needs. The next section provides an overview of different users, together with their needs. General examples are provided alongside.

2.2 Audiences and users of climate change-related statistics

12. Users of climate change-related statistics are many, and they differ in their data needs and knowledge. Some users of climate statistics have a deep understanding of the topic and are used to handling data and statistics, while others have little or no prior knowledge and are not experienced in reading raw data or complicated tables and visualizations. Some may even consider the topic of climate change statistics too complex or overwhelming.

13. Increasing public interest in a broad range of climate change-related issues, including emissions and mitigation / net zero policies, impacts on communities and the environment, the increasing need and benefit of adaptation and interconnected links with other topics such as the economy, health, transport and policy, brings new and emerging user groups of climate change-related statistics. In turn, this increases the need for NSOs to map and understand users and their needs.

2.2.1 Who are the public?

14. In this chapter, we focus on the public as key recipients, users and demanders of climate change-related information. Here, the public comprises primarily private individuals, who may have many different information needs. They may be interested in climate data for their own information or in order to participate in conversations with friends or at work, or to be involved in politics or climate activism. They may also need climate change data in their professional occupation, e.g. for

³ <https://unfccc.int/topics/education-and-outreach/workstreams/public-participation>

⁴ Article 18 of the Doha Work Programme on Article 6 of the Convention

⁵ Guidelines for accelerating solutions through education, training and awareness-raising:

https://unfccc.int/files/cooperation_and_support/education_and_outreach/application/pdf/action_for_climate_empowerment_guidelines.pdf, table 1 on page 14. and Article 19 of the Doha Work Programme on Article 6 of the Convention

preparing policy or legislation, providing training, or giving lectures or interviews as an expert, for strategic planning or for developing data-driven apps etc.

15. The mainstream media along with social media, NGOs and civic society all play a role in making information and data available to the public. For the purpose of this chapter, public need does not include data access and transfer between NSOs and academia, but it does include activities of individual researchers when undertaken as private individuals (perhaps with a specific or professional need for climate change-related data).

2.2.2 User groups and their needs

16. Recipients and users of climate change-related data and statistics can be categorized into four user groups. These groups are defined by how users come into contact with climate data and statistics (for example, passively receiving or actively searching) as well as their prior understanding and knowledge of climate change and data analysis, respectively. Some examples are given for each of the user groups, even though some groups of individuals (such as journalists) may, in reality, be present in more than one user group.

Table 1. User groups for climate change-related statistics

Generally interested citizens	Specifically interested	Professionals and policymakers	Analysts
<ul style="list-style-type: none"> • Passively receiving or actively searching for information • Encounter data via press or social media, blogs or publications or internet searches • Infrequent visitor to statistics-related websites • Without special or professional interest in climate change data 	<ul style="list-style-type: none"> • Actively searching for information • Looking for unbiased facts about topical issues • E.g. general journalists, teachers, students, or consultants 	<ul style="list-style-type: none"> • Actively searching for information • Prefer official statistics/ NSO as data source • Frequent users of statistics for benchmarking and comparison • Able to withdraw, customize and present data • May have own agenda or own media, data gives them credibility • E.g. climate journalists, employees in ministries, agencies, private companies and NGOs, climate activists. 	<ul style="list-style-type: none"> • Actively searching for information • Require official statistics/ NSO as data source • Data experts, data miners • Able to analyze and document data • Less interested in written publications • E.g. data journalists, researchers, climate experts, data-driven app developers

17. User groups may have very different needs, and NSOs should consider each and every user group when producing and disseminating data and statistics. A schematic illustration of the typical needs for climate change-related statistic products is shown below.

Table 2. Needs for climate change-related statistics products by user group

	Generally interested	Specifically interested	Professionals and policymakers	Expert analysts
Overview content Interactive maps, infographics, graphs Key figures, dashboards Simple wording, engaging visuals and titles				
Commented statistics Press releases, reports, analysis Thematic webpages				
Statistics Tables Documentation of statistics				
Data, including microdata Tailored and detailed data Anonymized micro data Geospatially enabled data				

18. **Overview content** should address the needs of all user groups and should be very easy for the public to access. Examples include interactive graphs and maps, climate figures and infographics. Most content will be suitable for publication on social media and be accessible to a non-technical audience. ‘Generally interested’ users will likely be satisfied with overview content, while ‘specifically interested’ users, ‘professionals and policymakers’ and ‘expert analysts’ may use this as a starting point for researching further. References to other relevant data or information sources (to underlying datasets or links to policy, for example) may also be part of overview content.

19. **Commented statistics** will be slightly more technical than overview content and might include press releases, explained statistics, shorter articles, reports or thematic web pages. These products may be too specific or in-depth for ‘generally interested’ users but are expected to suit the needs of users that are ‘specifically interested’ in identifying or finding climate change topics. ‘Professionals and policymakers’ as well as ‘expert analysts’ may use commented statistics as a starting point for researching further or for more detail.

20. **Statistics** will comprise more technical tables and in-depth articles or reports. These might be available from NSOs on different climate topics and might include documentation of methodology, sources and data treatment. This format will likely require a significant level of thematic or analytical knowledge and will likely be unsuitable for ‘generally interested’ and ‘specifically interested’ users but should satisfy the needs of ‘professionals and policymakers’. Analysts may use these statistics for creating novel visualizations, analyses or as background or supporting evidence in reports or articles. They may also be used as a starting point for further work, such as mapping additional data availability in order to structure micro-level data analysis.

21. **Data, including highly disaggregated data and microdata**, (under special conditions) may be provided by NSOs to certain data users, by data request or via specific user searchers. This highly granular data will be too complicated or technical for ‘generally interested’ or ‘specifically interested’ users as well as most ‘professionals and policymakers’, although some users from this group may find it useful. However, ‘expert analysts’ should find this data useful for individual research or analysis.

2.2.3 New and emerging users of climate change-related statistics

22. As analytical methods become more advanced, a number of new and emerging user groups for climate change-related statistics emerge. These might include developers of apps or websites focused on interactive decision-making tools such as carbon footprint or carbon offsetting calculators or climate-friendly travel decision tools, for example. These tools may rely on emissions or other climate related data to underpin their functionality.

23. Individuals involved in generating social media content, like bloggers, vloggers, influencers or climate activists, may also have an increasing demand for climate change-related information, data and statistics.

24. In addition to these, there is an increasing demand to understand the links and connections between climate change and topics such as finance and business, health, public behaviour, transport and the environment, from which there may be considerable demand and interest across a range of climate change topics.

2.2.4 Experiences on the interest and information needs of the public

25. The media are an important source of information for the public. Members of the Task Force interviewed journalists from across the UNECE region during 2022. The interviews were conducted using a structured interview technique where journalists were asked a set of pre-prepared questions. This enabled a systematic collation of answers, which were then compared and analysed.

26. Journalists are a key group responsible for obtaining and disseminating information, data and statistics to the public. They should therefore have a good understanding of what topics are of current public interest and the best ways to effectively reach their audience.

27. A summary of the interviews, along with a set of key findings on how NSOs can help to better inform the public, are provided below.

28. Interviewed journalists comprised more and less technically competent individuals, covering a range of climate-related topics, and included those working on traditional story-focused narratives as well as those that prefer to create novel graphics, visualizations and analysis. Some of these have specialized data or GIS analysis skills and often work on stories with data as an essential element.

Climate-related data of most interest to the public

29. Journalists working on climate change stories often cover a broad set of interconnected issues spanning environmental, social and economic topics. These can include the wider environment, energy, agriculture, transport, business and politics.

30. Stories can cover the underlying science of climate change as well as its impacts on people and communities that may focus on small-scale local action, or on global long-term trends and comparisons.

31. The following are some examples of stories:

- (a) Extreme weather and its impacts – for example, rainfall, drought, rising temperatures like the European heatwave experienced during summer 2022, or climate projections
- (b) Civil society mobilization
- (c) Local interest, for example, how cities can adapt, local impacts on communities, local action
- (d) Agricultural topics, natural resources and wider environmental issues

- (e) Geo-politics
- (f) Global climate-science stories
- (g) Energy
- (h) Transport
- (i) Science

Sources most used by climate journalists

32. Journalists use a variety of different data sources, depending on the story. This includes official and hydrometeorological statistics as well as press releases and reports from both home and international sources.

33. Time, resources and technical skill often dictate which sources are used. Journalists with more advanced technical skills tend to prefer creating unique visualizations and use sources that provide access to underlying datasets. Less technical journalists, or those on tight timeframes, often prefer to use ready-made reports and analysis. There can be difficulty understanding which source to use and when.

34. Public information services that provide the ability to search and query content can be very helpful in supporting journalists to locate appropriate information without the need for in-depth research and data mining that require significant resources and technical skills.

35. Some journalists mentioned using social media to look for data, which has some advantages, particularly in terms of timeliness and responsiveness. At the same time, this comes with a high risk of coming across exaggerated or false information. However, this approach can be particularly useful for identifying, corroborating and supplementing other data sources.

36. Official sources of information are recognised as critical to good journalism.

37. For those working on global topics, the language and format of the report, data or statistics are of primary concern. **Resources that are in English and are easily accessible will be accessed and used more often.**

Which climate-related data are difficult to access

38. Most journalists report that **physical metrics**, such as the weather, emissions or energy, are generally well available at the country level.

39. More difficult to access are social, environmental and economic metrics, such as those that might inform on climate change impacts or adaptations, or on the interactions between climate change and other areas (such as finance, society, health, nature etc). The following are some specific examples identified by journalists:

- (a) **Climate adaptation**
- (b) **Businesses and finance:**
 - (i) including financial climate change aid sent to other countries
 - (ii) emissions data from large individual companies
 - (iii) interactions between climate risks and economic damage
- (c) The impact of climate change on both **health** and **nature**
- (d) Consumer **carbon footprint** metrics

40. Aside from topic-specific issues, journalists reported four difficulties: (1) coverage, (2) timeliness, (3) granularity; and (4) accessibility.

41. Considering **coverage**, the following issues were mentioned:

- (i) Lack of availability, particularly for parts of Africa, Asia and Latin America and others outside of the OECD
- (ii) Different scales, geographies and lack of coherence

42. **Insufficient timeliness** issues concerned both periodic, e.g. annual publications based on historical data and up-to-the-minute data.

43. **Granularity** issues stem from inconsistencies in the availability of data collected or provided at a sub-national level. This refers to a lack of consistency in what data is collected at this level within a country, the scale at which it is collected and the statistics that are provided, analysed and shared by local or regional data providers. Journalists often want more local-level data to inform on local stories but face difficulties in finding data at the right scale for the right place.

44. **Accessibility** issues are two-fold and often contradictory. Some journalists want more consistently available data in open formats to allow easy and speedy access for novel analyses and visualizations. Others do not have the skills, resources or time for this and want more accessible reports with ready-made analysis and visualizations that can easily contribute to, supplement and enhance narratives.

45. For less technical journalists, there can be difficulties navigating complicated scientific reports where specific data, analysis and conclusions may be difficult to find.

46. Comments include:

- (a) NSO service desks are useful facilities to support journalists in contacting the NSO and querying data, data products and reports
- (b) The use of multiple and conflicting reference periods [in the context of temperature increase, e.g.] is confusing. Standardised and fewer reference periods would be helpful.

47. In summary, less technical journalists need triggers like press releases, preferably based on integrated reports. Particularly helpful are:

- (a) Fact sheets and dashboards where the most relevant data can be searched and selected.
- (b) Pre-releases under embargo in order to publish the moment the data becomes officially available.

48. Technical journalists need reliable and independent data which are easily available, for example:

- (a) Geospatial data in simple, usable standard formats (for example, shape files, JSON, vector product format, etc.)
- (b) Free, open-source data (for example, GitHub, CSV, Tableau, etc.).

49. Please note that these comments reflect the experiences of journalists only within the UNECE region, and we cannot comment on data availability more widely.

3 How NSOs can contribute

3.1 The role of NSOs in informing the public

50. The first Fundamental Principle of Official Statistics states that “Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information.”⁶

51. Informing the public is at the core of the mandate of national statistical offices. This is achieved by compiling and making available data on relevant topics from the economic, demographic, social and environmental domains, in an impartial way, following standards, using proper sources, and accompanied by metadata. The role of NSOs in informing the public is crucial, as, thanks to these principles, they have been widely considered trusted data providers. In the present time, in which data from unverified sources are abundant and both information and disinformation are spreading at a rapid pace, this role is even more important. By ensuring the availability of trusted statistics to the public, NSOs also contribute to a wider social goal of transparency and accountability and building a relationship between the state and the citizens. At the same time, by providing reliable statistics on issues relevant to the public, NSOs enforce their role as a key component of the information system of a democratic society. However, to determine what is relevant, it is particularly important that NSOs understand the users and potential users of their statistics and their information needs.

52. This principle emphasizes one important aspect of how official statistics serve the public – not only by being compiled but also by being made available to the citizens. NSOs have decades-long expertise in disseminating their products in an impartial, transparent, and accessible way and have been putting a lot of focus on how to communicate statistics effectively. This expertise can be very valuable in the climate change domain, in which there are multiple data compilers, often outside of the statistical system, who may not have had an equally strong focus on making their data available and easily accessible to the public. NSOs can play a role in communicating the climate topic in a purely factual manner, especially in potentially disputed areas where there may be national or local political controversy in climate-related issues.

53. In practice, NSOs first and foremost contribute to informing the public by publishing relevant and high-quality statistics. This includes greenhouse gas (GHG) emissions data, but also other types of climate change-related statistics, as is described in the next section.

3.2 Producing climate change-related statistics of public interest

54. National statistical offices compile, produce and make available statistics on greenhouse gas (GHG) emissions. These can be compiled using the SEEA framework emissions accounts.

55. National statistical offices can provide guidance to the users when it comes to the different methods of compiling emissions data, IPCC and SEEA-type statistics or production based vs consumption-based emissions approaches. An example of explaining measurement perspectives on air emissions is provided by Eurostat (<https://ec.europa.eu/eurostat/web/environment/information-data/emissions-greenhouse-gases-air-pollutants>).

56. It can be useful to consider the user groups and their needs so that an easy-to-access text box describing the most important methodological concerns is available, potentially with a technical

⁶ <https://unece.org/FPOS30>

description available for more technical users. Metadata or documentation of statistics can be used to provide more information, which can help the user assess the fitness of use for different purposes.

57. NSOs may also collect, make available and use in the production of additional statistics, alternative emissions data and statistics from other national agencies. This might include data from the national emission inventories, if these are produced outside of the NSO, or energy statistics from energy agencies.

58. Aside from emissions data, NSOs may provide other climate related statistics. Journalists provided some examples of topics they also had an interest in:

- (a) Foreign climate-related aid
- (b) Climate-related health expenditure
- (c) Figures and values that show how different aspects of climate change relate to each other
- (d) Waste management
- (e) Low-carbon energy consumption
- (f) Connecting micro data on businesses with their GHG emissions

3.2.1 Geospatial data

59. The demand for local and detailed climate change-related statistics increases the focus on geospatial data for climate change-related statistics. Geospatial data adds location information (coordinates, municipality codes, regional information etc.) to the statistics.

60. This demand includes data that has specific and high granularity to a more general demand for data at a subnational level.

61. One example from Denmark is a recent project on grouped municipal emission accounts averages for urban and rural areas could then be compared.

62. More technical journalists have expressed a need for geospatial data in order to show and explain climate-related data via novel spatial visualizations or infographics.

63. There are multiple considerations on how NSOs might meet the demands for geospatial statistics in the climate change domain. Some are below:

- (a) Source data may not include geospatial data
- (b) Whether the approach should be top-down (splitting the national total down to smaller local entities) or bottom-up (adding up the emissions for companies at a sub-national level to a national total) and what to do with discrepancies between methods.
- (c) Priority and resource allocation within the NSO to enable and support the development of high-quality geospatial data.

3.3 Dissemination and communication of climate-related statistics

64. Different users have different needs and interests when considering appropriate climate change-related statistical products. Journalists offered some examples of good data and statistical products:

- (a) Europe 1 degree warmer, available at <https://www.onedegreewarmer.eu/>

- (b) Thematic website on climate change-related statistics in Denmark, available [in Danish] at <https://www.dst.dk/klima>
- (c) Energy Information Administration and “Today in Energy” blog, available at <https://www.eia.gov/todayinenergy/>
- (d) Disseminating geospatial data and World Resources Institute, available at <https://www.wri.org/data>
- (e) National Oceanic and Atmospheric Administration (NOAA), available at <https://www.noaa.gov/climate>
- (f) UK Climate Change Committee for less complicated and accessible datasets, <https://www.theccc.org.uk/>
- (g) CE Delft’s practice of disseminating figures on individual companies, <https://cedelft.eu/>

65. A general challenge facing climate analysts is to go from the global to the individual perspective. An aspect that NSOs may consider is a pathway to enable links between the statistics and effects on the individual. E.g. effects related to private transport, income and electricity consumption may increase the relevance for the public from climate change-related statistics.

3.3.1 The role of NSO as an active data provider, proactively reaching out to the public

66. Journalists often use data provided by NSOs. NSOs hold an important role in providing and disseminating data and statistics. This is at least as important as government ministries and hydrometeorological services in most countries.

67. Official sources of climate change-related statistics, including NSOs, government ministries and hydrometeorological organizations, are primary sources for many journalists, but the importance and impact of each in communicating and disseminating to the public varies across countries.

68. NSOs may provide climate-related data to the public in various ways, including both static and interactive content covering statistical yearbooks, bulletins, articles, websites, portals, dashboards, social media, tables, graphics, geospatial data and mapping tools, and downloadable files etc.

69. In addition, NSOs can proactively engage in outreach activities. Many of these may be focused on schools and education institutes to support teaching climate change topics and to engage students around climate change and climate change-related statistics. One example of this from Denmark is a project designing a statistics-based interactive learning platform for schools.

70. The UK Office for National Statistics provides two further examples of the dissemination of statistics to the public. The first is the Climate Change Statistics Portal, a cross-government freely accessible online dashboard that brings together climate change-related data and statistics from across the UK and devolved governments (Welsh Government, Scottish Government and the Northern Ireland Executive). This dashboard provides charts and underlying datasets that can be accessed online or downloaded by users and is focused on the six core climate change pillars: ‘emissions’; ‘drivers’; ‘mitigation’; ‘climate and weather’; ‘impacts’; and ‘adaptation’.

71. The second example is Climate Change Insights; a quarterly article that brings together climate change-related statistics from across the UK. Each quarter focuses on one of four themes: ‘families and households’, ‘natural and rural environment’, ‘business and transport’, and ‘health and well-being’ and covers sections on ‘emissions and drivers’; ‘moving towards net zero (attitudes and behaviours)’; ‘state of the climate in the UK’; and ‘impacts and signs of adaptation’. Articles provide

core climate change statistics as well as interconnected contextual data to provide additional insights and narrative.

3.3.2 NSOs actively using social media or other platforms

72. Use of social media to disseminate statistics is not as widespread as traditional methods but is on the rise. The UK Office for National Statistics, for example, has just started conveying key statistical points via Instagram for the first time, having used Twitter regularly for several years.

73. Journalists are aware of social media as a potential dissemination channel for public awareness on environmental issues but also as a means of delivering public scrutiny. However, this comes with a known risk of encountering exaggerated or false information, so it should be used with caution.

74. Increasing the use of social media to disseminate climate change-related statistics would be beneficial in increasing outreach and engagement with sections of the public that may not already engage with traditional dissemination products.

75. Some challenges may come with this approach. NSOs will need to consider resources, such as timely engagement with social media content and users, will be crucial to making effective use of this format. NSOs may also need to consider big data management tools. These needs will likely develop further if and when the use of this format increases.

76. NSOs can provide links or guidance for users to find other sources, e.g. hydrometeorological data and climate-related legislation, to help users find more relevant data – or even become more informed on climate-related topics.

3.3.3 Machine readability, user support and engaging with the public

77. Generally, NSOs disseminate many indicators, and journalists often find it difficult to know and find the most appropriate sources. On the other hand, in many cases, users need more detailed information for specific projects or stories.

78. Less technical journalists, or those with tight timeframes or limited resources, often prefer to avoid undertaking lengthy or complicated research and instead opt for more readily available reports or use services that can assist in finding appropriate resources effectively and efficiently.

79. More technical journalists generally prefer to access data that is machine-readable and easy to access and extract.

3.4 How to work with the press office/communication experts within the NSO and map and evaluate user needs

80. NSOs have dedicated communications departments that often include strategic communications, external affairs and media relations offices. Focusing on different elements of communications, these will: guide and coordinate communication activity; collate and coordinate stakeholder insight, impact and engagement; and promote and disseminate work through external media channels, respectively. The communications department and the statistical experts at Statistics Denmark, for example, have a short weekly meeting to discuss potential publications or ideas for posts on social media (the meetings cover all areas of statistics, not only climate-related data). The stories can be triggered by recent events in the media, international climate meetings or new ways of integrating data from different statistical domains.

81. NSO statistical and data publications are often combined with media or press releases to publicise content and inform journalists of key points. Media relations offices can therefore be a

critical route to highlighting new data sources and statistics and disseminating information to the public.

82. User engagement plays a key role for NSOs and might include thematic (climate) focus groups, analysis of website usage (via Google Analytics, for example) and feedback surveys (such as hotjar). They can be a good way for NSOs to map the demand for information and evaluate if the chosen approach/design of websites, publications and statistical products effectively fulfils user needs.

4 Conclusions and recommendations

83. The role of NSOs in informing the public about statistics and data relating to climate change ties in with the principles of Action for Climate Empowerment as well as the Fundamental Principles of Official Statistics. There are several user groups for climate change-related statistics, and preferences differ in terms of communication products, channels and dissemination of data.

84. The public is interested in both in-depth stories and insight-driven graphics on a wider range of climate change topics spanning environmental, social and economic issues. However, there are significant gaps in data availability, particularly on the impacts of climate change, its interactions with health, the economy and nature, and of adaptation. There are also broader difficulties with the level of granularity and accessibility of data.

85. Country examples provide insights into how the NSOs can work to disseminate and communicate climate change-related statistics, actively reach out to the public, use social media and other channels, and work with machine searchability and coordination between statistical experts and communications staff within the NSO.

86. Recommendations:

- In order to ensure and contribute to public awareness and public access to information on climate, the NSOs can map and regularly evaluate user needs and user experience, specifically with climate change-related statistics. Tools like focus groups, analysis of website use and feedback surveys can be used.
- New and emerging user groups and technologies underline the need for NSOs to communicate widely, proactively as well as improve machine readability and searchability of statistical products and websites.
- NSOs could assist users by collecting links or resources to relevant sources such as national legislation, temperature and weather data or international comparisons. This can be done through thematic websites or dashboards for climate-related statistics and indicators.
- Data content on platforms such as thematic pages and dashboards can be presented according to the structure “drivers”-“emissions”-“impacts”-“mitigation”-“adaptation”. International comparisons and information available in English increase the relevance of such channels for some users.
- NSOs should provide user guidance on the different methods/approaches for emissions compilation, ideally both for generally interested users in a short format (e.g., key figures or short fact box) as well as for expert analysts via e.g. technical notes and documentation.