

CONFERENCE OF EUROPEAN STATISTICIANS

Expert Forum for Producers and Users of Climate Change-Related Statistics

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ADMINISTRATIVE MICRODATA FOR CLIMATE CHANGE, ENERGY AND ENVIRONMENT STATISTICS –
WEBINAR NOTE

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Abstract

*This paper was originally developed to provide a basis for discussions at the joint UNECE/IEA/Eurostat Webinar on Administrative Microdata for Climate Change, Energy and Environment Statistics, which was organized on 20 March 2023, at the request of the 2022 Expert Forum. The paper aimed to summarize the knowledge and practices identified and outlined the main emerging issues. It was further updated after the webinar with the outcomes of the discussion and examples collected during the meeting. **It is presented to the Expert Forum for information and discussion.***

I. BACKGROUND

1. Among new data sources for climate change, energy and environment statistics, particularly promising are administrative microdata, such as utility meter data, energy performance certificates of buildings and vehicle tests data. These sources can complement traditional data collection methods to increase the efficiency of data production or enable producing new statistics, indicators and analyses.
2. Such statistics and analyses should be particularly important for charting the transition to a low carbon economy and the associated ambitions of just transition and leaving no one behind. Emissions from buildings and from transport are sizeable, and microdata related to those two sources of emissions should be of high interest to statistical producers. The meter and household level administrative microdata could be linked with socio-demographic surveys to produce new innovative environment-related statistics such as differences by household type. Energy-related microdata could provide a much more detailed understanding of time series trends in the consumption of energy at the household and enterprise level. The administrative microdata are also relevant for developing statistical indicators for the European Green Deal.
3. Obtaining access to and using administrative microdata is an important first step towards future attempts to obtain access to and use data from smart meters.
4. The 2022 UNECE Expert Forum for Producers and Users of Climate Change-Related Statistics discussed the current practices of using such data based on a [questionnaire](#) conducted by the Steering Group on Climate Change-Related Statistics and a [paper](#) and [presentation](#) by the Central Statistics Office

of Ireland. Based on the discussion, the Expert Forum recommended that a webinar be held in early 2023 to gather more information on the current use of large-scale environment-related administrative microdata for statistical purposes. The webinar was held on 30 March 2023 as a joint event by UNECE, International Energy Agency and Eurostat.

II. DISCUSSION AT THE 2022 EXPERT FORUM FOR PRODUCERS AND USERS AND CLIMATE CHANGE-RELATED STATISTICS

5. The questionnaire conducted by the Steering Group on Climate Change-Related Statistics included the following question:

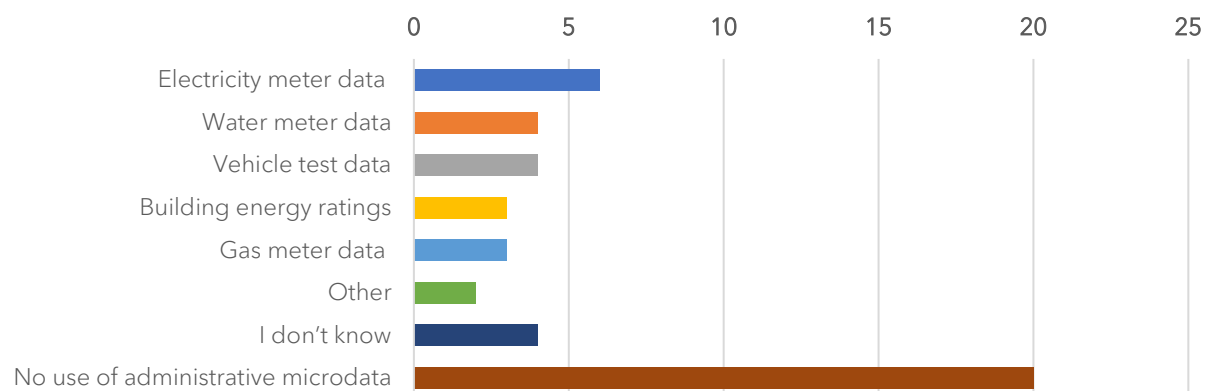
Q. Is your organization using any administrative microdata for producing climate change-related statistics, such as:

- *Water meter data*
- *Gas meter data*
- *Electricity meter data*
- *Building Energy Ratings*
- *Vehicle test data*
- *Other: ...*
- *No use of administrative microdata*
- *I don't know*

6. In response to this question, 9 out of 33 countries reported using some kind of administrative microdata for producing climate change-related statistics. The most commonly used (6 countries) was electricity meter data, followed by water meter data and vehicle test data (4 countries). The use of building energy rating and gas meter data was reported by 3 countries.

7. In 20 countries, no administrative data is used. As a reason, two countries mentioned a lack of availability or access to such data.

Figure 1. Does any of the responding organizations from a given country use any administrative microdata for producing climate change-related statistics? (n=33)



Source: [Climate Change-Related Statistics in Practice 2022](#) report by UNECE CES Steering Group on Climate Change-Related Statistics

8. In the Expert Forum discussion, it was noted that existing data sources should be leveraged cost-effectively, including linking data from across multiple sources and domains. New data sources, emerging technologies and methods offer unprecedented opportunities but require addressing methodological, technical and quality verification issues, as well as strengthening staff skills and ensuring a legal basis to access the data.

III. RATIONALE FOR THE PROPOSED ADMINISTRATIVE MICRODATA FILES

9. **The webinar focused mainly on accessing and using utility meter data, energy performance certificates of buildings and vehicle tests data as they have been identified as most relevant in the context of climate change, energy and environment statistics.** The rationale for each type of microdata is explained below.

10. **Metered electricity consumption.** This may be the most complete file nationally, as all households and most enterprises should be connected to the electricity grid. The dataset could be used for many indirect purposes, such as a check of vacant dwellings from the Census of Population; construction of new dwellings and buildings; electric vehicle public charge point meters; in conjunction with price data to show customer responses to price changes; and thematic reports, e.g. meters relating to data centres or agriculture. The installation of Smart meters will be an opportunity to analyse whether peak electricity demand is lowered through off-peak price incentives. Such analyses would require frequent meter readings e.g. half-hourly.

11. **Metered gas consumption.** The metered gas dataset may not be as complete nationally as the electricity meter file if rural areas are not connected to the main gas network. Meter consumption information on power stations using natural gas to generate electricity could be integrated into business energy use surveys.

12. **Metered water consumption.** Water consumption data for premises connected to the metered public water supply can provide climate-related information and could be combined with meteorological and hydrological datasets.

13. **Energy Performance of Building Certificates.** Reducing the energy consumption of new and existing buildings is an important condition for achieving Climate Action Plan targets. The type of core information needed includes main space heating fuel, main water heating fuel, use of renewable energy (e.g. heat pumps), type of dwelling (e.g. mid-floor apartment), total floor area, and period of construction. These characteristics can show time-series trends and whether new dwellings are more energy efficient and are using electricity as their main space heating fuel.

14. **Vehicle roadworthiness tests.** Many countries require vehicles to undergo road worthiness checks after a certain age. The odometer reading may be collected as part of the test. Combining odometer readings with fuel type could provide statistics on variations in annual vehicle kilometres travelled by electric and petrol/diesel vehicles etc. The odometer data could be used to get a better understanding of road transport emissions, especially if the files can be linked with vehicle fleet information and driver characteristics (age group and gender).

IV. ACCESS TO ADMINISTRATIVE MICRODATA

15. Access to the above-mentioned administrative microdata relies on several frameworks being in place, such as **legal, policy, organizational and technical frameworks.** A key question for obtaining

access may be the status of entities collecting the proposed microdata, which may vary by country and microdata category, e.g. single public authority, multiple public authorities, local or national entities, private entities, etc.

16. As far as the **legal framework** for access to administrative data is concerned, the 2018 UNECE Guidance on Modernizing Statistical Legislation¹ recommended that the law on statistics should include provisions that oblige all national and local authorities and private bodies to provide data in their possession to the producers of official statistics, if needed for statistical purposes and as far as appropriate within the policy settings of the public sector of the relevant jurisdiction. Data should be provided free of charge, at the level of detail necessary for the production of official statistics (including identifiers) and with the metadata that enable the assessment of data quality. The Guidance also recognized that there are opportunities for far greater use of administrative data and new data sources to shed light on complex policy problems and to reduce the costs and burden caused by direct data collection. Legislation must give statistical offices the ability to overcome challenges, acquire various data for statistical purposes and allow wide collaboration with public and private partners.

17. In practice, according to the analysis of the legal and institutional environment in the EU member states and EFTA countries² carried out under the ESS Vision 2020 ADMIN project, in most EU countries, NSOs have the authority to access any administrative source and use the data for any statistical purpose access. However, there are countries where some limitations may prevent their full use, e.g. NSOs may have access to only some sources or to all sources but only for selected statistical purposes. There are some countries in which a separate legal act is required to access each administrative source. In most countries where NSOs get access to microdata, these data do not have to be anonymised first before being transmitted to the NSO.

18. Some national legal frameworks may give more powers than others for access to administrative data for statistical purposes because of national historical, political and cultural factors. Some cultures are much more favourable than others to the idea of data sharing between government departments and agencies. To address this inconsistency, the EU has included provisions on access to administrative data in Regulation 223/2009 on European statistics, which gives the national statistical organisations of Member States the right of access to the administrative data needed to meet their obligations under European statistical legislation, but states that such access is still subject to national limits and conditions. Individual European Union regulations in specific areas of statistics go further and remove this dependency on national limits and conditions. An example of this is the business registers regulation, which gives unconstrained access to any administrative sources necessary to meet the requirements of the regulation. Legal frameworks also set out the limits to access to and uses of administrative data, e.g. that data can only be used for specific statistical purposes, and that the confidentiality of individual records should be maintained.³

19. The EU Regulation 223/2009 on European statistics is currently under revision to take account of the developments that have transformed the field of data and the environment in which European statistics are developed, produced and disseminated. Among others, the intention of the revision is to seize

¹[UNECE Guidance on Modernizing Statistical Legislation \(2018\)](#)

² Eurostat [Analysis of the legal and institutional environment in the EU Member States and EFTA Countries](#) (2018)

³ [UNECE Handbook on Using Administrative and Secondary Sources for Official Statistics](#) (2011)

opportunities provided by digital transformation – new data sources, emerging technologies and the growing data ecosystem – to meet the growing demand for more up-to-date, granular and responsive official statistics to support EU policies and public debate.

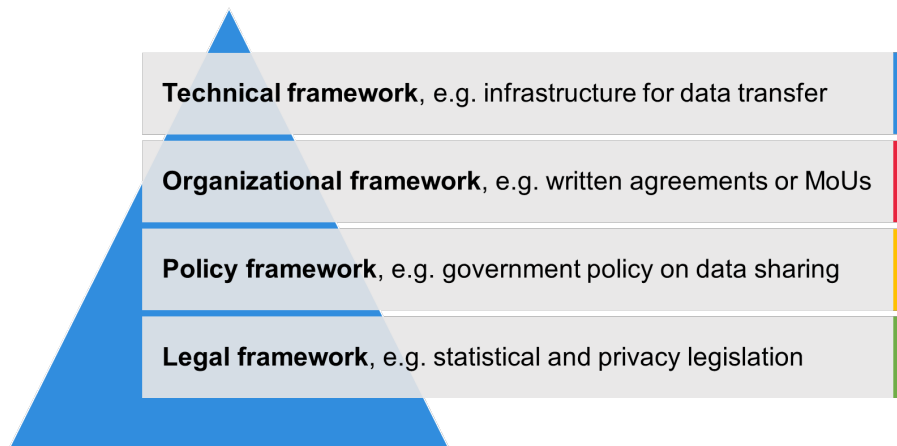
20. In addition to the legal framework, the policy, organisational and technical frameworks are also relevant for obtaining access to data.

21. The **policy framework** that will have an influence on the right of access may include general policies on data sharing within the government, including national or international codes of practice.

22. **Organisational arrangements** may cover putting in place written agreements, such as contracts, service level agreements or MoUs.

23. Finally, the **technical framework** includes technical means for transferring the data.

Figure 2. Frameworks needed for access to administrative microdata



V. ADDING VALUE BY COMBINING ADMINISTRATIVE MICRODATA

24. If the datasets contain common unique identifiers, then it may be possible to combine related datasets at the household level to obtain additional statistical value.

25. The inclusion of unique business identifiers in the utility data could facilitate NACE sector analyses and integration with energy surveys.

26. A household-level unique identifier would make it possible to combine the administrative microdata with the Census of Population to show how consumption or energy rating varies by the socio-economic characteristics of a household. Such a combined file could provide insights into energy poverty and provide a basis for more focused policy interventions.

VI. RECOMMENDED MICRODATA FILE CONTENTS

27. Two types of data files are needed for the utility meter datasets:

- (a) A customer file is needed that will contain the account number, meter serial number (in case the meter has been replaced and the meter reset to zero), name and address of the account holder, connection information such as voltage, locational identifiers such as postcodes and geocoordinates, and building and enterprise identifiers. The name of the account holder can be

used to assist with matching with business registers, NACE coding, and as input to decide whether the meter is used for residential or non-residential purposes (small businesses may be charged at a tariff appropriate to residential users).

- (a) A data file containing preferably calculated consumption in a specific period such as a quarter or month or an actual meter reading and reading date. Consumption calculated by the utility company will save NSOs having to convert meter readings in consumption periods. From a GDPR perspective, the data file should not contain customer names.

28. Although it was not proposed to discuss access to Smart meter microdata as part of the webinar, the webinar and its follow-up activities can prepare the ground for evolution into countries obtaining and using Smart meter data. The latter would require much greater data handling capabilities as half-hourly meter readings would be around 17,500 data points per annum per meter.

VII. EXAMPLES OF EXISTING STATISTICAL USE

29. Some links to existing national examples of microdata use have been given below.

Country	Example
Australia	Work underway on access and use of electricity use microdata; planned linkage to other ABS microdata - Webinar PPT
Denmark	Smart meter data on all electricity consumption in Denmark:
Ireland	<p>Work on electricity, gas and water meter microdata and building energy rating certificates, linked with census data; work in progress on a vehicle test odometer readings dataset - Webinar PPT</p> <p>Electricity meters:</p> <ul style="list-style-type: none"> • https://www.cso.ie/en/statistics/energy/meteredelectricityconsumption/ • https://www.cso.ie/en/statistics/energy/datacentresmeteredelectricityconsumption/ • https://www.cso.ie/en/statistics/energy/trendsinsmeteredelectricityandgasbills/ <p>Building energy ratings</p> <ul style="list-style-type: none"> • https://www.cso.ie/en/statistics/energy/domesticbuildingenergyratings/ • https://ndber.seai.ie/BERRResearchTool/ber/search.aspx • https://www.cso.ie/en/statistics/social/domesticbuildingenergyratingsfromasocialperspective/ • https://www.cso.ie/en/statistics/energy/householdelectricityconsumptionbybuildingenergyratings/
Italy	Statistical registers of places - Webinar PPT
Netherlands	Use of 20 energy-related microdata sources – focus on data about companies – Webinar PPT
Türkiye	<p>Vehicle register and vehicle inspection microdata for statistics on final consumption of energy in road and rail transport - Webinar PPT</p> <p>Vehicle odometer readings:</p> <ul style="list-style-type: none"> • https://data.tuik.gov.tr/Bulten/Index?p=Vehicle-kilometer-Statistics-2019-

	37409&dil=2
United Kingdom	<p>Building energy performance certificates, electricity and gas meters link to building stock, used for domestic and non-domestic National Energy Efficiency Data-Framework – Webinar PPT</p> <p>Building energy performance certificates (EPC):</p> <ul style="list-style-type: none">• https://www.gov.uk/government/statistical-data-sets/live-tables-on-energy-performance-of-buildings-certificates• EPC Open data communities: https://epc.opendatacommunities.org/• EPC statistics: https://www.gov.uk/government/collections/energy-performance-of-buildings-certificates

VIII. OUTCOMES OF THE WEBINAR

30. The webinar outcomes can be summarized as follows:

- (a) Confirmed huge interest in the topic, both from statistical offices, energy agencies, line ministries – 260 registered participants from 52 countries and 23 international organizations
- (b) A number of examples have been identified and more can be collected for a structured analysis of most successful approaches, challenges and lessons learnt by microdata type
- (c) Expected developments in the EU legal framework should strengthen the legal basis, but approach based on partnerships is the most promising and has already been successful in the current framework
- (d) Maintaining public trust and social acceptability are key – NSOs should have well-established internal procedures and safeguards for protecting the microdata
- (e) Obtaining access to and using administrative microdata is also an important first step towards future access to smart meter data

IX. NEXT STEPS

31. **The webinar aimed to provide a platform to share experience and knowledge about the availability and use of environment-related administrative microdata and identify and prioritize the next steps needed in supporting countries seeking to improve their use of administrative microdata for climate, energy and environment statistics.**

32. The topic “Administrative microdata for climate, energy and environment statistics” has also been selected for an in-depth review by the Bureau of the Conference of European Statisticians to take place in 2024, led by Ireland with contributions from other interested countries and international organizations.

33. The [in-depth reviews](#) are carried out regularly by the CES Bureau to coordinate statistical activities in the region, identify gaps and address emerging issues. The reviews are based on a paper prepared by volunteering countries or organizations taking stock of ongoing activities at international and national levels, identifying issues and challenges and proposing recommendations. Based on the paper, the CES Bureau discusses the topic and decides on actions to address the issues raised. The outcomes of the

reviews are presented to all the Chief Statisticians of CES member countries at the annual plenary session of the Conference.

34. The group preparing the in-depth review paper will build on the outcomes of the webinar and coordinate its work with the UNECE Steering Group on Climate Change-Related Statistics.

35. A survey gathering more detailed information about current practices in access and use of environment-related administrative microdata in all CES countries will be carried out later in 2023.

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