Economic Commission for Europe

Conference of European Statisticians
Expert Forum for Producers and Users of Climate Change-Related Statistics
31 August – 3 September 2021, Geneva, Switzerland (online meeting)

Summary and Conclusions of the 2021 Expert Forum for Producers and Users of Climate Change-Related Statistics

I. Attendance

1.   The 2021 UNECE Expert Forum for Producers and Users of Climate Change-Related Statistics took place from 31 August to 3 September 2021. The meeting was attended by the representatives of the following countries: Armenia, Austria, Belarus, Bosnia and Herzegovina, Brazil, Cabo Verde, Canada, Chile, Costa Rica, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Luxembourg, Mexico, Netherlands, Poland, Portugal, New Zealand, Poland, Romania, Russian Federation, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, and Uzbekistan.

2.   The Expert Forum was attended by the representatives of European Commission, Eurostat, International Monetary Fund (IMF), Organisation for Economic Cooperation and Development (OECD), the Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC), Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), United Nations Development Programme (UNDP), United Nations Economic Commission for Latin America and the Caribbean (UN ECLAC), United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP), United Nations Economic and Social Commission for Western Asia (UN ESCWA), United Nations Industrial Development Organization (UNIDO) and the United Nations Statistics Division (UNSD).

3.   Aarhus University; Academy for Mathematics, Science and Engineering; International Federation of Private Water Operators (AquaFed); Institute for Sustainable Innovation; Génération Maastricht; Midsummer Analytics, Universidade Federal Rural do Rio de Janeiro; University of Coimbra; University of Milan and Ms. J. Tafi also participated in the Expert Forum.

II. Organization of the meeting

4.   Mr. A. Denneman (Netherlands), the Chair of the Steering Group on Climate Change-Related Statistics, chaired the meeting.

5.   The Expert Forum consisted of four sessions:

- Session 1: Setting the scene (31 August 2021) – Session Chair: Mr. Arthur Denneman (Netherlands)
- Session 2: Measuring climate change vulnerability and adaptation (1 September 2021) – Session Chair: Ms. Giovanna Tagliacozzo (Italy)
- Session 3: Carbon footprint and consumption-based emissions (2 September 2021) – Session Chair: Mr. Olivier Thunus (Luxembourg)
- Session 4: Good practices in producing, disseminating and using climate change-related statistics (3 September 2021) – Session Chair: Mr. Robert Smith (Midsummer Analytics).

6. Summary and conclusions of each session are presented in section III below.

7. List of resources related to each session is included in the annex.

8. All meeting documents are available at: https://unece.org/statistics/events/expert-forum-producers-and-users-climate-change-related-statistics-2021.

III. Summary and conclusions

A. Session 1: Setting the scene (31 August 2021)

9. A systemic shift in how we use data and analytics to solve climate change is needed, fuelled by significant changes in both supply and demand.

10. On the supply side, a data revolution has been unfolding. Big data analytics, artificial intelligence, the internet of things and other advancements can bring a quantum leap in climate-related data. Still, the progress has to be based on Fundamental Principles of Official Statistics to ensure that new data will become a public good instead of the current trend of data privatization and inequitable business models.

11. On the demand side, the IPCC and biodiversity reports indicate that a massive transformation of the economy –from an extractive model to a regenerative one – is needed to avoid the worst consequences of climate change and biodiversity loss. This transformation should influence our planning for statistics for the coming decades.

12. The Paris Agreement is a pledge and review system in which the pledges must be quantifiable, the goals should be measured through indicators, and collective progress is assessed every five years.

13. Increasing data granularity is crucial for raising awareness, targeting policy response and addressing issues of equity and inequality. The existence of data on a certain issue can be the first step towards action.

14. Two complementary sets of climate change-related indicators have been developed. The UNSD set is targeted at all countries, considering the needs of countries with less developed statistical systems. The UNECE set focuses on the areas of climate change that are considered highly relevant for the CES member countries and is based on the SEEA to the extent possible. The UNECE and UNSD indicator sets both provide guidance for NSOs to implement national indicator sets in an internationally comparable way. Countries are welcome to choose indicators that are relevant in their context, may combine indicators from both sets, and add national indicators.

15. Monitoring green and climate finance is a new important topic for NSOs and provides an opportunity to test existing frameworks, develop new approaches and answer the user needs better.

Conclusion

16.   Recognizing and embedding requirements for the reporting under the Paris Agreement in official statistics will enhance the countries' institutional arrangements and readiness to participate in the Enhanced Transparency Framework (ETF) in a sustainable manner.

17.   International guidance is needed to set the right priorities for future activities in climate change-related statistics. The Expert Forum helps to share good practices to improve data availability and quality, and to develop new statistics on topics like climate change adaptation, carbon footprints and green finance. Further work will be needed to provide guidance on the involvement of NSOs in the post-Paris Agreement setting.

18.   The Expert Forum should continue discussing the topic of green finance with a specific focus on climate finance. A glossary with definitions, methodological guidelines and a review of existing initiatives would be helpful for NSOs.

19.   The 2022 Expert Forum for Producers and Users of Climate Change-Related statistics is planned to take place on 29-30 September 2022 in Geneva (to be confirmed).

B.   Session 2: Measuring climate change vulnerability and adaptation (1 September 2021)

20.   Climate change adaptation, that is, the process of adjustment to actual or expected climate and its effects, is an increasingly important component of climate change response and will require huge investment.

21.   Measuring adaptation and vulnerability is still a considerable challenge due to contextual and subjective factors. These include, among others, geomorphological features of the territory, urbanization and anthropization levels, and different risk appetites of the countries. Methodological work is needed on how adaptation metrics can be compared and aggregated across countries and contexts as adaptation cannot easily be reduced to one indicator (like GHG emissions for mitigation).

22.   Eurostat working on the first classification of climate change adaptation activities, using the conceptual framework of environmental economic accounting and its experience with operationalization of concepts for compiling environmental goods and services sector (EGSS) accounts and environmental protection expenditure accounts (EPEA). A number of boundary issues still need to be resolved to test feasibility of estimating headline indicators, such as GVA, jobs and investments.

23.   Nature-based Solutions (NbS) is an umbrella concept of actions that work with nature to help increase societal resilience towards climate change and disaster risks while providing a wide range of other multiple benefits, e.g. increased biodiversity. Measuring non-market benefits of NbS is key to allow their fair evaluation versus grey solutions, as the existing statistics are biased towards measuring market goods and services and tend to focus on the short term.

24.   The current Global Consultation affirmed that most of the indicators included in the Global Set of Climate Change Statistics and Indicators are sourced from specialized agencies (rather than existing national statistics) and the areas of vulnerability and adaptation are the least advanced in terms of international statistical guidance. Therefore, most of the adaptation indicators and statistics included in the Global Set are Tier 3, with limited data availability and varying relevance across countries and regions. Yet, countries and international agencies demonstrate strong interest and commitment to advance the methodological development and the work will continue.

25.   The template proposed by the UNECE Steering Group aims to stimulate collecting country case studies following a bottom-up but structured approach. The two first examples presented by Netherlands and Mexico are intended to pave the way for the further collection.

Conclusion

26.   Improving measuring adaptation requires collective – global and regional – efforts to develop and agree on concepts, definitions and methods, understand the data needs and share context-specific experiences and responses. There is a need to experiment, adopt iterative approaches and provide practical solutions starting from available statistical information. Collaboration between practitioners, policy makers, researchers and statistical offices is needed.

27.   There is an urgent need to increase the coherence of the EU and global sectoral policies in the area of nature based solutions and to develop and agree on quantitative and measurable indicators for monitoring, assessment and monitoring progress of NbS implementation and its effectiveness.

28.   In the long-term perspective, an international reference handbook on climate change adaptation activities will be needed to facilitate compiling comparable data.

29.   Many more case studies describing contexts, tools and methodologies are needed. The Expert Forum invited countries to share their work using the template developed by the Steering Group.

C.   Session 3: Carbon footprint and consumption-based emissions (2 September 2021)

30.   Carbon footprint is an estimate of GHG emissions associated with the production of goods and services delivered to final demand of the economy of the geographical entity, including both emissions occurring in the economy of the geographical entity and abroad. It is an important indicator allowing to monitor behavioral changes and has high potential to inform climate policies.

31.   Based on various national experiences, environmentally extended multi-regional input-output (EE-MRIO) modelling is the best approach to calculate the carbon footprint of a country.

32.   There is a need for long-term consistency, reliability and international comparability of footprint statistics.

33.   In a joint project (FIGARO), Eurostat, OECD and the European Joint Research Centre are developing a single authoritative environmentally extended MRIO dataset, consistent with SNA.

Conclusion

34.   The Expert Forum encouraged countries to start activities on producing carbon footprint and consumption-based emissions and share their experience on the UNECE good practice wiki and through the Expert Fora.

35.   The Expert Forum invited the NSOs to produce high-quality Input-Output tables and environmental extensions needed for the EE-MRIO modelling.

36.   The Expert Forum recommended that international organizations should define an international structure (similar to that of the OECD Regional-Global TiVA initiative) in charge of the integration of a common methodology to compile energy uses and environmental pressures (emissions, material, etc.) by activities consistent with MRIO tables and guaranteeing its regular update.

37.   The Expert Forum invited all countries to collaborate with the international EE-MRIO projects.

D.   Session 4: Good practices in producing, disseminating and using climate change-related statistics (3 September 2021)

38.   Considerable innovation is taking place in national and international statistical offices in relation to climate change-related statistics, paving the way for others to follow. Innovative use is being made of, among others, micro-data linkages, artificial intelligence, big data and finance-sector indicators.

39.   Quarterly data related to climate change are becoming increasingly common, reflecting the need to provide decision-makers and the public with more regular data on climate change. Policy analysts are increasingly calling for climate change-related data to be published as frequently and timely as flagship economic indicators like GDP to be able to craft economic policies that will effectively respond to the climate crisis.

40.   Collaboration is key to success in this rapidly evolving area. Measuring climate change involves using economic, social and environmental data compiled by a wide variety of agencies. Even if national statistical offices have much of the analytical capacity required to bring the data together, they may not have access to all the data or be aware of all users' needs or the best ways to combine data in meeting those needs.

41.   Integrating environmental and social statistics can provide key input to designing "just transition" policies and inclusive pathways towards a low-carbon economy, as presented by Ireland. Such data can be produced using a combination of surveys, modules, and administrative microdata. Microdata matching can add considerable value to existing standalone datasets. Coordination within NSOs is needed to incorporate environmental questions into economic and social surveys.

42.   Statistics on fossil fuel subsidies are of great interest to policymakers and the society but can also be politically charged because of high economic interests at stake. The work carried out by the OECD, International Energy Agency and Eurostat can be a starting point for national work.

43.   The pilot implementation of the CES Set of Core-Climate-Change-Related Indicators demonstrated that most of tier I and II and some of the tier III indicators in the UNECE's core set of climate change indicators are feasible for statistical offices with well-established environmental statistics programs. Environmental accounts based on the SEEA framework can provide data for about one-third of the indicators. For others – especially those requiring spatial data –non-SEEA environmental statistics are needed.

44.   Inclusion of climate change-related statistics in existing publications is a cost-effective approach to dissemination, which is particularly welcome given the financial constraints of every statistical office.

45.   Using innovative tools can help to kickstart the work, bring together the stakeholders and in the long-term improve the country's capacity to produce national data.

Conclusion

46.   The Expert Forum welcomed presented examples of innovative work and encouraged countries to use presented examples as inspiration to improve availability and quality of climate change-related statistics and indicators. Countries are invited to continue sharing their work through the Expert Fora and the good practice wiki.

47.   Cross-sectoral coordination and guidance on priorities in environmental-social statistics are needed at international level to advance linking environmental, economic and

social information and maximise the value of existing data for climate change related statistics.

48.   An effective dissemination strategy for climate change-related statistics can involve leveraging existing publications, including publications devoted to the SDGs

49.   Systematic use of indicators to measure progress towards climate objectives and evaluate the effectiveness of national and international climate action is essential to gain feedback on the relevance of the indicators and improve related statistics and accounts.

Annex I. List of resources

A. Session 1: Setting the scene (31 August 2021)

CES Steering Group on Climate Change-Related Statistics:

- [Presentation on Climate change-related statistics in the UNECE region](#) (Statistics Netherlands)
- [CES Recommendation on Climate Change-Related Statistics](#) (UNECE, 2014) and [leaflet summarizing the Recommendations](#)
- [Example Road Maps for Developing Climate Change-Related Statistics](#) (UNECE, 2017)
- [In-depth review of the role of the statistical community in climate action](#) (UNECE, 2020)
- [UNECE Good practice wiki](#)
- [Climate Change-Related Statistics in Practice 2021](#)

UNFCCC:

- [Presentation on transparency under the Paris Agreement](#) (UN Climate Change Secretariat)
- [NDC synthesis report](#) (published on 26 February 2021, covering 48 new or updated NDCs (representing 75 Parties)
- [CGE regional webinars](#)

UNSD:

- [Presentation on the Global Set of Climate Change Statistics and Indicators](#) (UNSD)
- Global Set: https://unstats.un.org/unsd/envstats/climatechange.cshtml and https://unstats.un.org/unsd/envstats/ClimateChange_StatAndInd_global.cshtml

ECLAC:

- [Presentation - Overview of activities related to measuring climate change in the Latin America and the Caribbean region](#) (UNECLAC)
- [CEPALSTAT DATABASE](#)
- [ECLAC Statistical Yearbook (Environment Statistics Chapter)](#)
- [COVID-19): systems approach to disaster risk in the Caribbean](#)
- [Environment Statistics Biblioguide](#)
- [Regional Network of Env Stats](#)
- [ECLAC Statistics Division](#)

UNECE:

- [Presentation on the outcomes of the 1st Expert Forum for producers and users of disaster-related statistics and the Joint OECD-UNECE Seminar on SEEA implementation (UNECE)](#)
- [First global Expert Forum for Producers and Users of Disaster-related Statistics](#): 7, 8 and 10 June 2021
- [Joint OECD/UNECE Seminar on SEEA Implementation](#): 9-11 March 2021

Luxembourg:

- [Measuring green finance: new challenge for NSOs? (Luxembourg, Netherlands, Bennet Institute and UNECE)](#)
- [REGULATION (EU) 2020/852 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 June 2020](#) on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088
- [Paris Collaborative on Green Budgeting](#)

B. Session 2: Measuring climate change vulnerability and adaptation (1 September 2021)

UNFCCC:

- Presentation on Data, indicators and monitoring & evaluation for Adaptation (UNFCCC)
- UNFCCC. 2018. Expert meeting on national adaptation goals/indicators and their relationship with the Sustainable Development Goals and the Sendai Framework for Disaster Risk. Report by the Adaptation Committee.
- Möhner, Navi and Tawfig (2020): Chapter 3 of the UNEP Adaptation Gap Report 2020
- UNFCCC. 2021. Approaches to reviewing the overall progress made in achieving the global goal on adaptation. Report by the Adaptation Committee.
- 25 Years of Adaptation under the UNFCCC. Report by the Adaptation Committee.

Aarhus University:

- Presentation - Nature-based solutions for climate adaptation (Aarhus University)
- EEA publication *Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction*
- European Commission NbS valorisation reports (Biodiversity, Climate mitigation, Microclimate regulation & air quality, Improving water quality & waterbody conditions, Flood mitigation & coastal resilience, summary report State of the Art in EU-funded projects)
- Urban Nature Atlas from the NATURVATION EC H2020 project (online resource)
- H2020 projects' handbook on public procurement of NbS
- H2020 projects' NbS Impact Assessment *Handbook for Practitioners* & *Appendix of Methods*
- PEDRR & FEBA *Working paper Promoting NbS in the Post-2020 Global Biodiversity Framework*
- Convention on Biological Diversity *5th Global Biodiversity Outlook*
- *The Economics of Biodiversity: The Dasgupta Review*
- IPBES Reports (Regional & sub-Regional assessments of biodiversity and ecosystem services – multiple, Land Degradation Assessment, Global Assessment Report, IPBES/IPCC report due on 22 May 2021)
- Recent IPCC reports (multiple)
- UNEP *Adaptation Gap Report 2020* & synthesis report *Making Peace with Nature*
- World Economic Forum *Global Risks Report 2021: 16th Edition*
- NbS case studies currently stored in Oppla.eu
- IUCN Global Standard on NbS
- REGREEN Horizon 2020 project

Steering Group on Climate Change Related Statistics:

- Presentation of case studies template (UNECE)
- Template for Measuring Climate Change Adaptation - Case studies

Netherlands:

- Presentation on the impacts of unusual weather on the Gross Domestic Product (GDP) (Netherlands)
- The impacts of unusual weather on the Gross Domestic Product (GDP) – case study
- The impacts of unusual weather on the Gross Domestic Product (GDP) – report (2014; Pim Ouwehand and Floris van Ruth)
- The impacts of unusual weather on the Gross Domestic Product (GDP) – update (2020; Pim Ouwehand), in Dutch

Mexico:

- [Presentation - Measuring climate change adaptation through the National Atlas of Vulnerability to Climate Change (Mexico)](#)
- [National Atlas of Vulnerability to Climate Change](#)

C.   Session 3: Carbon footprint and consumption-based emissions (2 September 2021)

France:

- Written contribution to the Expert Forum: [French carbon footprint– calculation improvement planned](#)
- [Carbon footprint in France](#)

Netherlands:

- [Presentation on Producing carbon footprint in the Netherlands](#)

Spain:

- [Carbon footprint in Spain](#)

Sweden:

- [Carbon footprint in Sweden](#)
- ["Towards Robust, Authoritative Assessments of Environmental Impacts Embodied in Trade: Current State and Recommendations"](#), (Tukker A., Koning A. de, Owen A., Lutter S., Bruckner M., Giljum S., Stadler K., Wood R., Hoekstra R.) *Journal of Industrial Ecology,* 22(3), 2018.

United Kingdom:

- [Carbon footprint in the United Kingdom](#)

Eurostat and JRC:

- Paper: ["Footprint type indicators at country level" Eurostat – Unit E2: Joint Meeting of the Working groups Environmental accounts & Monetary environmental statistics and accounts](#):
- ["Comparing the GTAP-MRIO and WIOD databases for carbon footprint analysis"](#), (Iñaki Arto, J.M. Rueda-Cantuche and Glen P. Peters), *Economic Systems Research*, 2014, 26(3), pp. 327-353.
- ["Econometric analysis of European carbon dioxide emissions based on rectangular supply-use tables"](#) (J. M. Rueda-Cantuche) *Economic Systems Research*, 23(3), 2011, pp. 261-280.
- ["Comparisons of the European Carbon Footprint (2000-2006) from Three Different Perspectives within a Multi Regional Framework: New Empirical Evidences"](#), (J.M. Rueda-Cantuche), en: Costantini, V., Mazzanti, M. and Montini, A. (eds.): Hybrid Economic-Environmental Accounts, Routledge Studies in Ecological Economics: Oxford, 2011, 125-139.
- ["World Input-Output Database Environmental Accounts"](#), (Corsatea, T., Lindner, S., Arto, I., Roman, M., Rueda Cantuche, J.M., Velazquez Afonso, A., De Amores Hernandez, A. and Neuwahl, F.), Publications Office of the European Union, Luxembourg, 2019.
- ["Trade-SCAN v2: A user-friendly tool for global value chain analysis"](#), (Roman, M., Rueda Cantuche, J.M., De Amores Hernandez, A. and Florencio Jimenez), P., Publications Office of the European Union, Luxembourg, 2020.

OECD:

- Carbon dioxide emissions embodied in international trade. http://oe.cd/io-co2
- Wiebe, K. S. and N. Yamano (2016), "Estimating CO2 Emissions Embodied in Final Demand and Trade Using the OECD ICIO 2015: Methodology and Results". OECD Science, Technology and Industry Working Papers, No. 2016/5, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jlrcm216xkl-en
- Yamano, N. and J.J.M. Guilhoto (2020), " CO2 emissions embodied in international trade and domestic final demand", OECD Science, Technology and Industry Working Papers, No. 2020/11, OECD Publishing, Paris. https://doi.org/10.1787/8f2963b8-en
- Guilhoto, J.J.M., N. Johnstone, F. Mattion, F. Papadimoulis, R. Quadrelli and C. Webb (2021 forthcoming) Methodology for Estimation of Energy Physical Supply and Use Tables based on IEA's World Energy Balances, OECD Science, Technology and Industry Working Papers, No. 2021/##, OECD Publishing, Paris.

D. Session 4: Good practices in producing, disseminating and using climate change-related statistics (3 September 2021)

Ireland:

- Presentation on Snapshots in the Development of Environmental-Social Statistics (Ireland)
- Paper: "Snapshots in the development of environmental-social statistics" (Gerry Brady, CSO Ireland) 2021 UNECE Expert Forum for Producers and Users of Official Statistics Working Paper no. 1
- Energy Efficiency of Dwellings
- Fossil Fuel Subsidies
- Censuses of Population and Agriculture
- Environmental indicators report 2020
- Climate-related Environmental Accounts
- Plant Phenology, vehicle odometer data and Climate Data Rescue project of detailed daily meteorological data
- Survey of household environment behaviours (Q2/2014 and Q3/2021):
- Data on environmental subsidies

Italy:

- Presentation - Implementing the UNECE climate change indicators - the Italian Experience (Italy)
- Detailed analysis: ebook (in Italian only) : ECONOMIA E AMBIENTE: UNA LETTURA INTEGRATA. Istat.

IMF:

- Presentation on Climate change indicators dashboard (IMF)
- IMF Climate Change Indicators Dashboard https://climatedata.imf.org/

UNSD:

- Presentation on Measuring Climate regulation services using ARIES for SEEA Explorer (UNSD)
- https://seea.un.org/content/aries-for-seea

OECD:

- Presentation on IPAC - International Programme for Action on Climate (OECD)
- OECD work on climate
- OECD international repository in support of climate action https://www.oecd.org/environment/climate-data/

- IPAC https://www.oecd.org/climate-change/IPAC/ and https://www.oecd.org/climate-change/ipac-fr/
- HP on Climate and Economic resilience https://www.oecd.org/env/cc/brochure-horizontal-project-on-climate-and-economic-resilience.pdf