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High-level segment:

High-level dialogue

Toolbox of instruments of the Economic Commission for Europe related to digital transformation

Note by the secretariat

The high-level segment of the seventieth session of the United Nations Economic Commission for Europe (ECE) will be held under the theme “Digital and green transformations for sustainable development in the region of the Economic Commission for Europe”. Related issues have been prominent areas in the work of the Commission for many years and have yielded a rich body of instruments and knowledge products in its eight subprogrammes.

This document lists key instruments developed by ECE that respond to and facilitate the digital transformation and, in many instances, contribute to further progress towards the green transformation. These tools, developed along some of the core functions of ECE – development of norms, standards and legal instruments and policy advice – are available to member States and other stakeholders in support of their efforts towards the digital and green transformations.

Additional information on selected ECE instruments that support the green transformation may be found in the toolbox that was elaborated for the sixty-ninth Commission session, entitled “Circular economy and the sustainable use of natural resources: Toolbox of instruments of the Economic Commission for Europe” (E/ECE/1496).



I. Introduction

1. The high-level segment of the seventieth session of the United Nations Economic Commission for Europe (ECE) will be held under the theme “Digital and green transformations for sustainable development in the region of the Economic Commission for Europe”. Related issues have been prominent areas of the work of the Commission for many years and have yielded a rich body of instruments and knowledge products in its eight subprogrammes.

2. **Environment:** The environment subprogramme maintains and supports the implementation of digital tools and elaborates guidelines and recommendations to facilitate easy access to information, promote the application of common approaches and standards, and support efforts to implement relevant international commitments. Digitalization provides many opportunities to help safeguard the environment but can also have significant adverse impacts on the environment and human health, for example through the growing demand for hardware and electricity, and result in exclusion of some groups if not implemented in a sustainable manner. The environment subprogramme therefore supports activities to green our digital future, including through promoting the transition to a circular and green economy.

3. **Transport:** The transport subprogramme delivers the Inland Transport Committee (ITC) Strategy until 2030. A core pillar of this Strategy is to support ITC as the United Nations Platform for promoting new technologies and innovations in inland transport, among other things by ensuring that its regulatory functions are keeping pace with cutting-edge technologies driving transport innovation – especially in the areas of Intelligent Transport Systems, autonomous vehicles and digitalization – thus improving traffic safety, environmental performance, energy efficiency, inland transport security and efficient service provision in the transport sector.

4. **Statistics:** Statistics has always been about describing the society, economy and environment in numbers. This has been increasingly a largely digital process. Statistical Offices contribute in two ways to the digital transformation: providing the necessary statistics to measure and support the digital transformation in the country, as well as further transforming and developing their own digital capabilities in terms of the core dimensions (technologies, individuals, organization and processes). The statistics subprogramme is leading the global work using new digital data sources and machine learning, and other data science methods to produce ever more statistics for policy makers, businesses and the general public.

5. **Economic Cooperation and Integration:** This subprogramme supports ECE member States in developing and implementing institutions, policies, processes and initiatives to build innovative, competitive and inclusive societies. Digitalization and technology are at the heart of these activities, whether to promote the circular economy, align infrastructure projects with the Sustainable Development Goals (SDGs), facilitate multimodal cross-border trade or increase member States’ productivity and competitiveness. Guidance materials and methodologies, such as the Innovation for Sustainable Development Reviews, facilitate the evaluation of projects and strategies, and provide recommendations to foster innovation and support the digital transformation.

6. **Sustainable Energy:** Digitalization revamps the energy landscape and is becoming an integral part of energy policies. It enables continuous improvements in the overall efficiency of the energy system ensuring net benefits to its participants by finding ways to address emerging challenges through advances in connectivity, data and analytics. Recognizing this, the Committee on Sustainable Energy established in 2020 a dedicated Task Force on Digitalization in Energy to take charge of the related activities and serve as a platform for the subsidiary bodies of the sustainable energy subprogramme to conduct relevant research and assess the sectoral opportunities and side-effects of digitalization in energy.

7. **Trade:** Digitalization has a tremendous impact on global trade. Instant data exchange, electronic invoices, automated business processes and real-time tracking are just some of the examples. To ensure that these solutions can be applied globally, the Trade subprogramme

has developed a number of internationally recognized models, rules, languages and standards. The tools support the ability of companies, trade and administrative organizations from all countries to effectively exchange products, services and information, and verify claims about origin, sustainability and circular performance.

8. **Forests and the Forest Industry:** The subprogramme has extensive experience in using digital means to gather information on forests, forest management and forest products and wood. Unlocking the full potential of digital means is a key area of work and led to the successful dissemination of all data in the single platform “INForest”. The subprogramme strives to increase the use of digital means to further improve the efficiency of collecting, processing and publishing relevant data and the effectiveness of presenting information and analysis to the public in an attractive and easily accessible way.

9. **Housing and Land Management:** The subprogramme implements the approach of “People-smart sustainable cities” to promote sustainable smart urban development in an inclusive, collaborative and equitable way. Through the development of ECE smart sustainable cities profiles that contain concrete recommendations, the subprogramme supports cities in accelerating achieving the SDGs. Through supporting the United for Smart Sustainable Cities (U4SSC) Initiative as part of its secretariat, the subprogramme provides a platform for cities to exchange experiences and best practices in the use of digital tools and other smart cities solutions. The digital transformation in land administration is promoted through studies, webinars and publications that support more robust and transparent registration of land and properties.

10. **Population:** Digitalization holds promises for societal adaptation to population ageing, but there are also risks for older people without digital skills and access to digital devices being left behind in an increasingly digital world. The Standing Working Group on Ageing of ECE has therefore put increasing emphasis on discussing policy strategies and exchanging good practices in embracing the potential of digital innovation for health and care services, assistive technologies, among others, as well as efforts of enhancing digital skills and literacy to ensure that older persons can fully and securely benefit from online communications, learning opportunities and access the full range of online services.

II. Toolbox of ECE instruments related to Digital Transformation

11. In the table below, selected ECE instruments are listed that support member States and other stakeholders in the digital transformation. This “toolbox” is arranged by ECE subprogrammes and provides a brief description of the scope of each instrument, including the contribution it makes to supporting the green transformation. To facilitate access to additional information, further materials are hyperlinked. Given the wealth of outputs of ECE, the toolbox does not strive to be exhaustive.

12. This ECE toolbox complements the report on “Digital and green transformations for sustainable development in the region of the Economic Commission for Europe”, as contained in document E/ECE/1504.

13. Additional information on selected ECE instruments that support a green transformation may be found in the toolbox that was elaborated for the sixty-ninth Commission session, entitled “Circular economy and the sustainable use of natural resources: Toolbox of instruments of the Economic Commission for Europe” (E/ECE/1496).

Subprogramme 1: Environment

Category	Tool	Description	Impacts, including for green transformation
Policy Advice	Shared Environmental Information System (SEIS) – support to countries in implementing SEIS at national level	SEIS organizes environmental information according to agreed key principles to create online systems that make environmental information available to multiple users for improved decision-making. It facilitates regular environmental assessments, monitoring and reporting on progress on multilateral environmental agreements and towards the 2030 Agenda for Sustainable Development, as well as sound policymaking.	SEIS aims to improve national capacities to produce, track and share environmental information and data. It contributes to monitoring progress towards the achievement of the 2030 Agenda for Sustainable Development.
Norms, standards and legal instruments	Aarhus Convention: Recommendations on the more effective use of electronic information tools	The Recommendations assist governments in the promotion of inclusive and effective access to information, public participation in decision-making and access to justice in environmental matters using electronic information tools. They facilitate the development, maintenance, upgrade and use of a nationwide digital environmental information system and enable measuring and progress reporting towards the achievement of relevant international and national goals and targets.	<p>The Recommendations support, <i>inter alia</i>, evidence-based decision-making and policy development related to environmental matters; enhance early notification measures; identify emerging environmental risks and vulnerabilities; and support a multi-hazard early warning system.</p> <p>With regard to green transformation, the Recommendations aim to raise public awareness of product information (e.g. through product databases, digital product passports, eco-labelling, energy efficiency and eco-auditing schemes and environmental product declarations), knowledge of good practices and guidelines related to green economy transition, green procurement and sustainable use of natural resources and reporting on SDG indicators and other relevant international and national targets.</p>
Norms, standards and legal instruments	PRTR: Kyiv Protocol on Pollutant Release and Transfer Registers (Protocol on PRTRs)	A PRTR is an online environmental database of potentially hazardous chemical substances released to air, water and soil, and transferred off-site for treatment or disposal. PRTRs promote digitalization and automatization of data reporting and management tasks and PRTRs further transparency in environmental matters across the globe.	PRTRs support harmonized data collection and dissemination standards for pollutants; reporting data on production volume and resource consumption; They drive the development of national legislation and practice towards a common set of international standards, and support evidence-based decision making. Given complex global production and supply chains, adherence to PRTR register standards can help reduce pollutant releases and promote a green and circular economy.

Subprogramme 2: Sustainable Transport

Category	Tool	Description	Impacts, including for green transformation
Norms, standards and legal instruments	eTIR International System	<p>The Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention) is the only universal customs transit system in existence.</p> <p>The eTIR international system seeks to ensure the secure exchange of data between national customs systems related to the transit of goods, vehicles or containers according to the TIR Convention, and to allow customs to manage the data on guarantees, issued by guarantee chains to holders authorized to use the TIR system.</p>	The TIR system already reduces cross-border transport time by up to 80 per cent and lowers costs by up to 38 per cent. The computerization of the procedures of the Convention will unlock significant further efficiency gains. It has a direct impact on the reduction of trucks waiting / queuing times at the borders, meaning less air pollution and CO ₂ emissions and less vehicle wear.
Norms, standards and legal instruments	Regulation No. 155 - Uniform provisions concerning the approval of vehicles with regards to cyber security and cyber security management system	This ECE regulation addresses the risks of cyberattacks in automated vehicles. It provides a framework for approval of the vehicle manufacturers Cyber Security Management System (CSMS).	Industry sources suggest that the regulations will affect more than 20 million vehicles worldwide in over 60 countries.
Norms, standards and legal instruments	Regulation No. 156 - Software Update and Software Update Management System	<p>This regulation provides a framework for approval of the Software Update Management System (SUMS) of vehicle manufacturers.</p> <p>The potential generalization of over-the-air software updates in the automotive sector creates a safety risk and a legal uncertainty both for Authorities and vehicles manufacturers that the regulation seeks to address.</p>	Safer update procedures would minimise risks and facilitate the upgrade and adoption of software in vehicles.
Norms, standards and legal instruments	<p>Regulation No. 157 – Automated Lane Keeping System</p> <p>Regulation No. 160 – Event Data Recorder</p>	<p>United Nations Regulations related to automated and connected vehicles:</p> <p>This regulation, including the Data Storage System for Automated Driving, provisions a <i>de facto</i> gateway for data out of automated vehicles.</p> <p>This regulation defines the requirements for a system in conventional vehicles that collects vehicle data and records the last five seconds before crashes.</p>	The regulations contribute to creating a data ecosystem that facilitates the development of automated and connected vehicles and reaping the benefits associated to these new technological possibilities, including higher traffic efficiency and improved safety.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	International Transport Infrastructure Observatory	<p>The Observatory is developed on a Geographical Information System (GIS) platform and has three main pillars:</p> <ul style="list-style-type: none"> • Electronic repository of ECE inland transport conventions, project outputs, and deliverables of designated Groups of Experts • Innovative tool to finance transport infrastructure • Promotion of sustainable regional and interregional connectivity 	The Observatory provides a platform that consolidates all relevant transport infrastructure data to facilitate decision-making regarding infrastructure development, financing, coordination and cooperation.
Policy Advice	Climate Change Adaptation and Transport infrastructure tool	This modelling tool allows for analysis of possible future impacts of climate change on transport networks. By bringing together projections from the World Meteorological Organization and the Intergovernmental Panel on Climate Change on specific climate factors with transport infrastructure maps, the user can identify possible hot spots in the road networks, e.g. locations that might be flooded in the future, etc.	The tool allows decision makers to address the important challenges posed by the impacts of climate change (especially the ones linked to climate-related hazards) and identify adaptation requirements for international transport networks.
Policy Advice	Sustainable Inland Transport Connectivity Indicators tool (SITCIN)	The SITCIN.org user platform enables governments to better understand the performance of their inland transport systems across three dimensions of sustainability (economic, social and environmental).	SITCIN.org offers a comprehensive self-assessment process which inter alia covers aspects related to the use of information and communications technology (ICT) and intelligent transport solutions, as well as measures aimed at reduction of greenhouse gas (GHG) emissions, air pollutants and noise emissions by considering levels of modal split, alternative fuel share and average age of vehicle fleets. The outcome of each national assessment provides a sound basis for enhanced evidence-based policy making.
Policy Advice	SafeFITS Model - A road safety decision-making tool	The modelling tool Safe Future Inland Transport Systems (SafeFITS) facilitates knowledge-based transport policy decision-making related to reducing road traffic injuries. It is based on historical road safety data and relationships between several road safety parameters and provides information on different road safety scenarios.	The tool can assist governments and decision makers in identifying the most appropriate road safety policies and measures to improve road safety.
Policy Advice	ForFITS Model - Assessing Future CO ₂ Emissions	The model seeks to foster sustainable transport policies For Future Inland Transport Systems (ForFITS). It compares projections between a baseline scenario and scenarios where proposed transport policies are implemented, estimating the	The tool assists users in making informed decisions about measures available for the reduction of CO ₂ emissions in the transport sector. Results of these analyses can be used to support the implementation of future transport policies.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
		amount of CO ₂ emissions that could be "saved" by their implementation.	
<u>Work in progress</u>			
Norms, standards and legal instruments	Framework Document on Automated/Autonomous vehicles	The document guides the future work on norms, standards and legal instruments of the United Nations in this strategic area for the future of automated/autonomous mobility.	Automated/autonomous vehicles are deemed to have significant benefits both for road safety and reduced environmental impact thanks to optimized and standardized driving patterns.
Norms, standards and legal instruments	ECE Road Map on Intelligent Transport Systems	The road map contains 18 actions that aim to guide the work of ITC in the field of Intelligent Transport System during the period 2021–2025.	Intelligent transport systems enable the optimization of resources, promote multi-modal passenger and goods transport, and reduce GHG emissions.
Norms, standards and legal instruments	Technical regulation (new or amended regulation No. 151) to address “Field of Vision Assist”	The regulation will address matters related to augmented reality in vehicles, providing road safety related information to the driver within the direct field of vision.	Safety related information displayed in the drivers' direct field of vision will help to focus on current driving situation and assist drivers in decision making in complex situations, thus enhancing road safety and reducing environmental impact by route optimization.
Norms, standards and legal instruments	eCPD	<p>The “carnet de passages en douane” (CPD) system is based on two international conventions (1954 Customs Convention on the Temporary Importation of Private Road Vehicles; and 1956 Customs Convention on the Temporary Importation of Commercial Road Vehicles).</p> <p>The system facilitates the temporary importation of private and commercial vehicles. The high-level architecture and the conceptual specifications of the system are being finalized with a view to launching the system in 2024.</p>	The digitalization of the CPD Distribution System is expected to speed up the border crossing for millions of automobilists around the globe by significantly reducing their administrative burden. Additionally, the exchange of customs information in a secure environment will help to prevent false submission of customs declarations.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Norms, standards and legal instruments	eCMR	<p>The eCMR is based on the provisions of the Convention on the Contract for the International Carriage of Goods by Road (CMR) (1956). The 2008 Additional Protocol to the CMR (eCMR) seeks to modernize the current system of paper consignment notes to an electronic format.</p> <p>A group of experts on eCMR has been established to agree the high-level architecture of the future eCMR system.</p>	<p>There are more than 1 billion paper CMRs issued annually worldwide. The electronic CMR will dramatically reduce waiting / queuing times of trucks at the borders. The exchange of transport and customs information will take place in a secure environment that will assist in further preventing false submission of transport data therefore reducing customs fraud.</p>

Subprogramme 3: Statistics

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Norms, standards and legal instruments	Standards towards modernization of statistics	<p>Various standards and accompanying tools have been developed to provide common references to describe core activities, business processes, information flows in statistical organizations. Other reference models refer to common reference architectures and statistical production architectures that allow sharing of (digital) statistical services within and between organizations:</p> <ul style="list-style-type: none"> • Generic Statistical Business Process Model (GSBPM) • Generic Statistical Information Model (GSIM) • Common Statistical Production Architecture (CSPA) • Generic Activity Model for Statistical Organizations (GAMSO) • Generic Statistical Data Editing Model (GSDEM) • Common Statistical Data Architecture (CSDA) <p>For each model implementation, tools are available, including CSPA service catalogue (sharing digital services), clickable versions and a Core Ontology for Official Statistics, a tool that defines a conceptual integration framework to provide semantic coherence across these models based on a common vocabulary of terms, definitions and a well-defined set of inter- and intra-model relationships formalized in Resource Description Framework (RDF)/ Web Ontology Language (OWL), using digital standards vocabularies, e.g. SKOS, PROV, DCAT, DC, ORG, etc.</p> <p>Digital platforms (on Wiki, GitHub, etc.) have been developed to exchange and co-create digital code and services to further automatize the processes of data collection, editing and dissemination, for example through Machine Learning algorithms.</p>	<p>These integrated sets of models and tools allow statistical offices to make their statistical production process (all digital) more efficient and to better exchange information and share statistical services within and between offices (100 per cent digital). It further allows to automatize various aspects of statistical production, for example, by replacing human price takers or manual processes with automated data collection and data editing.</p> <p>These tools contribute in two ways to the green transformation of member States in the ECE region. On the one hand, by making the production process of statistics more efficient and using fewer resources, the direct environmental footprint is reduced. On the other hand, the use of new data sources, technologies and methodologies, allows the production of more statistics that are needed in policy making for a transition to a green economy as a lot of data is needed to measure and monitor improved human well-being and social equity, and the reduction of environmental risks and ecological scarcities.</p>

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Norms, standards and legal instruments	Geospatial standards/data	Standards and tools are developed to allow for better integration of Geospatial and Statistical Information. Examples are GeoGSBPM, Data Integration Guidelines (including for Geospatial data) and Machine Learning solutions, tools and methods (code) for imagery analysis.	It allows the inclusion of geospatial data in statistical production for example to support measuring the impact of climate change.

Subprogramme 4: Economic Cooperation and Integration

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Building Back Better: using platforms to enable sharing and Circular Economy	This policy paper explores the potential of digital platforms in the context of the 2030 Agenda for Sustainable Development generally, and the transition to the circular economy in particular. It provides a definition of digital platforms and the sharing economy, elaborating on what drives their development, explores trends, consequences and challenges and proposes a set of policy recommendations to guide member States in their efforts to enable and promote innovation.	Digital platforms hold the potential to radically increase opportunities for sustainable consumption by putting excess capacity to better use – allowing people to consume more with less products and, consequently, less resource use and waste.
Policy Advice	Innovation Policy Outlook	The Innovation Policy Outlook assesses the scope and quality of innovation policies, institutions, and processes, including for the digitalization of government services and digital platforms.	It guides member States in strengthening efforts to enable and promote innovation for sustainable development in line with the 2030 Agenda and the SDGs.
Policy Advice	Public-Private Partnerships (PPP) Evaluation Methodology for the SDGs	The PPP Evaluation Methodology for the SDGs is a unique platform to score digital PPP and infrastructure projects against the SDGs.	Since its adoption in November 2021, more than 100 projects in 20 countries have been scored and assessed using the Methodology. These digital PPP and infrastructure projects contribute to the SDG achievement and the green and digital transformations.

Subprogramme 5: Sustainable Energy

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Norms, standards and legal instruments	United Nations Framework Classification for Resources (UNFC)	<p>The UNFC is a system for classifying and reporting natural resources, including critical raw materials required for low-carbon transitions, that considers technical, social, environmental, and economic challenges and opportunities.</p> <p>A digital UNFC tool integrates natural resource information, sharing of best practices and connects to other information systems such as GIS, financial and reporting systems for improved accuracy and better data quality.</p>	<p>Digitalized natural resource information available through the application of UNFC supports improved accessibility, better decision making, increased transparency, automated reporting, and more efficient management of the low-carbon transitions.</p> <p>UNFC supports a green transition by aligning resource management with the SDGs and promoting the use of renewable resources for a reduced carbon footprint and climate change mitigation.</p>
Norms, standards and legal instruments	United Nations Resource Management System (UNRMS)	The UNRMS is a comprehensive system for integrated, sustainable management of resources under fundamental sustainability principles, supported by blockchain and related technologies, such as Machine Learning and Artificial Intelligence.	The use of UNRMS digital modules enhances efficiency, transparency, traceability, and accountability in the management of natural resources, providing real-time data on sustainable natural resource usage and availability, thus contributing to evidence-based decision making.
Policy Advice	Digitalization: Accelerating the Electricity System Transformation	The document, developed jointly by the Group of Experts on Energy Efficiency and the Group of Experts on Cleaner Electricity Systems under the umbrella of the Task Force on Digitalization in Energy, discusses opportunities and benefits of digitalizing electricity systems, maps stakeholders involved, and outlines challenges for consideration by public authorities, private sector actors, and end-users. It also contains the results of a survey launched to acquire expert-level insights on challenges and opportunities of digitalizing energy systems across geographies.	It contains policy recommendations to accelerate electricity systems transformation through digitalization, to achieve higher levels of systemic efficiency while ensuring security and sustainability.
Policy Advice	Addressing Behavioural Barriers to Energy Digitalization	The document, developed by the Task Force on Digitalization in Energy of the Group of Experts on Energy Efficiency, considers aspects of human psychology, one of the crucial factors and the missing link in understanding the lagging implementation of digital technologies. It focuses on energy behaviour (actions that affect the way energy is utilized to achieve desired services) and its interlinkages with digitalization, energy efficiency, and broader energy system transformation.	The paper identifies and assesses seven barriers and suggests ways to overcome them, inter alia by leveraging digital insights.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Challenges of big data and analytics-driven demand-side management	<p>This policy paper, prepared by the Task Force on Digitalization in Energy of the Group of Experts on Energy Efficiency,</p> <ul style="list-style-type: none"> • reviews the current challenges of big data analytics within the context of distribution grid / demand-side management • describes policy gaps to the progress of advanced analytics in the utility sector; and • identifies key questions that deserve further analysis to address the challenges, gaps, and barriers to progressing state-of-the-practice for utility demand-side advanced analytics and advanced demand-side management 	The paper identifies key areas for further consideration and suggests specific issues for focused research and joined action of subsidiary bodies of the Committee on Sustainable Energy.
Policy Advice	Improving Efficiency of Buildings through Digitalization	This document, prepared by the Task Force on Digitalization in Energy of the Group of Experts on Energy Efficiency, presents evidence-based digitalization opportunities and benefits of using big data and advanced analytics to optimize the energy use of buildings and increase their energy efficiency over a lifetime (construction, occupancy, or retrofitting of residential, commercial, and industrial buildings). It discusses issues of consumer privacy and cybersecurity, the role of data centres and related environmental implications, and highlights the increasing importance of human capital.	The paper aims to raise awareness of policymakers and stakeholders for benefits, risks, uncertainties, and trade-offs related to energy efficiency, norms, standards and legal instruments of digital technologies in buildings. It also contains key recommendations for further consideration.
Policy Advice	Digitalization: enabling the new phase of energy efficiency	This discussion paper examines the role of digitalization and how it can help improve the efficiency of the overall energy system, while aiming to provide a clear, concise and balanced view on the matter to policymakers and other stakeholders. It presents some sectoral opportunities along with privacy and security risks and touches upon such aspects as data ownership, hosting, and management issues that have significant potential to optimize the overall energy infrastructure.	The paper highlights the impact that digitalization of the energy system may have on the economy and society, especially in terms of jobs and skills and why reskilling and upskilling will be critical for a sustainable energy future.
Policy Advice	Best Practice Guidance for Effective Management of Coal Mine Methane at National Level: Monitoring,	This guidance tool aims at assisting member States when designing national systems to quantify and report methane emissions from coal mines. Developed by the ECE Group of Experts on Coal Mine Methane and Just Transition in partnership with the Global Methane Initiative, it contains information on various digital tools from remote sensing	Action on methane requires solid understanding of emission sources at national, subnational, and local levels. Only with reliable emissions data, can policymakers design effective greenhouse gas policies, track the effectiveness of the adopted climate policies, evaluate mitigation opportunities, and comply with their international climate commitments.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
	Reporting, Verification and Mitigation	methods, such as satellite and aerial technologies, to modelling to reporting.	
Policy Advice	ECE Carbon Neutrality Toolkit	The toolkit seeks to support policymakers in making informed decision in support of digital and green transformations of energy systems. Developed by ECE expert community, this online portal includes three technology briefs on carbon capture, use and storage, hydrogen and nuclear power, and a brief on carbon neutral energy intensive industries. It also includes three publications: Technology Interplay under the Carbon Neutral Concept, the Life Cycle Assessment of Electricity Generation Options, and the CO ₂ Storage Potential in Eastern Europe, the Caucasus and Central Asia.	The ECE Carbon Neutrality Toolkit helps to identify technology and policy options to attain net-zero by 2050. A series of multistakeholder dialogues raised awareness about the potential of low- and zero-carbon technologies and their interplay to deliver on innovative and integrated energy systems.
<u>Work in progress</u>			
Policy advice	Digital Certificates/ Guarantees of Origin of the energy	<p>ECE supports member States in establishing digital certificates of origin, through the following tools:</p> <ul style="list-style-type: none"> • the Guarantee of the Origin of electricity • the International Renewable Energy Certificate (I-REC) • the Renewable Energy Certificate (REC) including electricity from renewable sources and produced in the process of high- efficiency cogeneration and renewable gases (biomethane, "green" hydrogen) • the Guarantee of Origin for Hydrogen (GOH) <p>ECE is currently exploring, from a policy perspective, certificates of origin that are digitized and processed through blockchain technology. The intent is to use blockchain to make certificates of origin that cover the full value chain and are credible. ECE could then provide guidance on the use of blockchain and digital tools to do lifecycle analysis.</p>	The certificates are meant to decouple physical and commercial flows and thereby accelerate renewable energy and hydrogen deployment, hence contributing to a reduction of GHG emissions.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Compendium of Case Studies on Digitalization in Energy in the ECE Region	This publication (scheduled for issuance in 2024) will provide a compendium of national case studies from selected ECE member States on digitalization in energy. They will include evidence-based policy recommendations and guidelines for policymakers on achieving higher levels of efficiency in the energy system by means of digitalization.	Case studies will present country-level insights on good practices and will indicate the potential for replication of relevant practices in the ECE region and beyond. It will also discuss benefits and common challenges on the path toward the digitalization of the energy system.

Subprogramme 6: Trade

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Norms, standards and legal instruments	Buy-Ship-Pay Reference Data Model (BSP RDM) - Business requirement specification	<p>The Model is based on the United Nations Centre for Trade Facilitation and Electronic Business (<u>UN/CEFACT</u>) <u>Core Component Library (CCL)</u> which brings together data exchange requirements of international cross-industry trade and multimodal transport processes including related insurance, customs and other regulatory documentary requirements.</p> <p>It can be applied by any country, region, or industry to provide definitions of contextualized transport-related data exchange documents, which can be integrated into software solutions for traders, carriers, freight forwarders, agents, banks, customs and other governmental authorities, etc.</p>	<p>The BSP schematic standards are used as the basis for data harmonization, which is essential for the preparation of Single Window implementations.</p> <p>The technology-neutral model aims to simplify processes and eliminate unnecessary details of a trade scenario through the use of electronic document equivalents and data sets, instead of paper documents.</p>
Norms, standards and legal instruments	United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT)	UN/EDIFACT comprises a set of internationally agreed standards, directories, and guidelines for the electronic interchange of structured data, between independent computerized information systems. They are published in the United Nations Trade Data Interchange Directory (UNTDID).	UN/EDIFACT is used by most international sectors, both in public and private domains, such as retail, transport and logistics, customs, healthcare, agriculture and insurance. Statistics from one sector alone showed that UN/EDIFACT was used by more than 100,000 companies and organizations with a predicted growth of 10 per cent.
Norms, standards and legal instruments	e-Basel	The e-Basel standard tracks waste movements as required by the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal.	It enables a more efficient implementation of the Basel Convention to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. E-Basel is therefore in direct support of international environmental law.
Norms, standards and legal instruments	e-CERT: Electronic Sanitary and Phytosanitary (SPS) Certificate	This standard regulates the exchange of information for traded agricultural products in cross border trade where export/import certification (SPS) is required to facilitate entry of product. It is a generic “container” for data about almost any certificate type, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Quality, Certificate of Origin.	This digital public tool expedites the exchange of documents in the supply chain, thereby avoiding unnecessary degradation of produce, transmission of pests and diseases and food loss. Hence, this standard contributes to waste prevention and increased resource efficiency.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Norms, standards and legal instruments	<u>e-Invoice</u>	This standard regulates electronic versions of an invoice and covers multiple sectors and multiple types of commodities.	It facilitates business processes, business transactions and the information entities of the invoice used by the industries in the supply chain. Directive 2014/55/EU designates UN/CEFACT Cross Industry Invoice as one of the two obligatory standards within the European Union (EU) for B2G (Business-to-Government) electronic invoicing (e-Invoicing).
Norms, standards and legal instruments	eCITES	CITES aims at ensuring that international trade in specimens of wild animals and plants does not threaten the survival of the species. The objective of eCITES is to improve the implementation of the Convention by streamlining compliant trade and combatting illegal trade through simplified and automated trade procedures.	eCITES helps government agencies to better target their inspections and identify those actors that break the law. CITES management authorities can save time and resources from checking and issuing permits to other important tasks for implementing the Convention and providing better services to traders. eCITES is therefore in direct support of international environmental law.
Norms, standards and legal instruments	United Nations Code List by Country and Territory) (UN/LOCODE)	UN/LOCODE is a five-character code system to identify all named geographic places which serve, in any way, as a place related to international trade.	UN/LOCODE is widely used by government agencies and private sector entities around the world, not only for international trade and transport but also in other areas, such as maritime security, environmental protection and sustainable fisheries. It contains over 100,000 entries covering 249 countries, territories and special areas.
Norms, standards and legal instruments	United Nations Fisheries Language for Universal Exchange (UN/FLUX)	UN/FLUX enables fishing industry operators to exchange information in a single and globally standardized way. It can be used in all phases of fisheries and gives automatic access to the electronic data needed for fish stock management.	UN/FLUX helps tackle overfishing by supporting the monitoring of over 70,000 vessels, and 470 fish stocks and quotas in the European Union alone. It is mandatory for EU member States and several countries trading with the EU. UN/FLUX is applied within the scope of the Control Regulation (EU) N° 1224/2009 and its Implementing Regulation (EU) N° 404/2011.
Norms, standards and legal instruments	Multi-modal transport and trade, use of standards	This package of standards seeks to strengthen interoperability and data exchange between documents, modes of transport and sectors.	The use of United Nations standards and modern information technology (IT) tools helps to streamline the fragmented data sharing along transport and supply chains. Electronic data exchange avoids delays and replaces paper documents, thus contributing to lower resource consumption and idle time.

Work in progress

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Value Chain Traceability Information Exchange Standard & Blockchain Pilot	ECE has developed policy briefs and recommendations, information exchange standards and a blockchain system for traceability and transparency to support the identification and coding of key data entities that need to be collected and exchanged by all value chain actors on products, processes and facilities. This toolbox supports reliable product claims about origin, sustainability and circular performance in the garment and footwear sector.	<p>The ECE initiative addresses consumers, investors, regulators, and civil society's demand for enhanced sustainability and circular performance in this industry. It is referenced as a key implementation initiative in global (e.g. the United Nations Environment Programme (UNEP), the World Trade Organization (WTO)) and regional (e.g. EU) policies and regulations in support of due diligence, sustainability reporting and uptake of innovation and advanced technologies for responsible consumption and production patterns (SDG 12 of the 2030 Agenda).</p> <p>To date, its Call to Action, launched in 2021, has received around 100 pledges from more than 350 industry actors. The blockchain pilots have involved more than 70 industry actors from 22 countries around the world.</p>
Policy Advice	United Nations Global Survey on Digital and Sustainable Trade Facilitation	The Regional Commissions jointly conduct this survey to help countries benchmark and reduce the time and cost of trading across border. The Survey currently covers 143 economies around the globe, and 58 measures related to the Trade Facilitation Agreement (<u>TFA</u>) of the WTO, as well as emerging regional and global initiatives on paperless trade or e-trade, such as the recent Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific (<u>CPTA</u>).	<p>The Survey leads to the production of a <u>Global Report and five Regional Reports</u>, which aim at providing insightful information for policy makers to harness trade as a key means of implementation of the 2030 Agenda. These reports enable countries and development partners to take a forward-looking approach to sustainable and digital trade facilitation, better understand and monitor progress, support evidence-based public policies, share best practices, and identify emerging capacity-building and technical assistance needs.</p>
Norms, standards and legal instruments	UN/CEFACT JSON Schema and JSON-LD Web Vocabulary	These tools are human and machine-readable representations of the UN/CEFACT Buy-Ship-Pay Reference Data Model. They generalize concepts of the Multi-Modal Transport Reference Data Model (MMT-RDM), the Supply Chain Reference Data Model (SCRDM), Recommendation 16, 20, 21, 24 and 28 code list, which can be applied by country and regional administrations and industries to facilitate cross-border trade, supply chain transparency, and many other use cases.	<p>The UN/CEFACT Core Component Library (CCL) is considered to be among the world's most mature supply chain vocabulary and a standards authority. JSON schema and JSON-Linked Data will allow its semantics to be used for modern (web) use cases, increasing the adoption of trade-related reference architecture and compatible common data models underpinning any green digital transformation strategy.</p>

Subprogramme 7: Forests and the Forest Industry

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Supporting national forest management through INForest	<p>The platform INForest provides up-to-date information about the size of the national forest area and how it has changed over decades, the structure of forests, the goods and services forests provide, as well as their contribution to the health of our economies, societies and the environment.</p> <p>INForest users can define the scope, format, and geographic coverage to search the available data sets with maximum flexibility.</p>	INForest improves the access to relevant and reliable data on forest conditions and uses for their protection and sustainable management in the ECE region, in particular to non-specialists and the general public. It serves as a tool for support of forest policy decision-making and communication about forests and the forest sector to the public at large.
Policy Advice	Online interactive data collection interfaces	<p>ECE, either alone or jointly with the Food and Agriculture Organization of the United Nations (FAO) and Forest Europe, in cooperation with experts and national correspondents, supports countries in developing harmonized data systems (definitions, classifications, reference years, reporting processes).</p> <p>The recent work aims at developing online interactive data collection interfaces with the possibility to define the scope and shape the format of acquired information.</p>	Online data collection results in a significant reduction of national reporting burden, improved completeness of data, and enhanced credibility and visibility of the data.
Policy Advice	Forest Policy and Management Support Information Systems (FPMSIS) – support to countries in implementing this tool at national level	ECE is supporting countries of the Caucasus, Central Asia, and Eastern Europe by providing them with the knowledge and tools to analyse their needs and develop their own forest-related information system.	Information Technology advances, and the ease of modern information exchange, have opened opportunities for better management of forest ecosystems and their services. FPMSIS help to gather forest information, making it accessible, informing decisions, monitoring results and modifying current policies. They increase operational efficiency, reduce cost, and supply better information, thereby improving forest ecosystem services and State governance. They also are a strategic tool for economic growth and provide the increased transparency and participation expected by modern society.
Policy Advice	Digital Joint Forest Sector Questionnaire (JFSQ)	Jointly developed by ECE, FAO, the International Tropical Timber Organization (ITTO) and Eurostat, this digital tool is issued once a year to collect annual data from member States about sustainable production and consumption of forest products.	The digital JFSQ helps to reduce the reporting burden for member States since it replaced more than fifteen separate questionnaires due to the joint and well-coordinated digital data collection of the four organizations involved. The data provide the core of assessing the sectors' progress made towards achieving SDG12.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Digital Joint Wood Energy Enquiry (JWEE)	Jointly developed by ECE, FAO, the International Energy Agency (IEA) and Eurostat, this digital tool is issued every two years to collect data from member States about sustainable production and consumption of wood energy.	The digital JWEE is a tool that improves data collection at national level and facilitates cross-sectoral cooperation between forest, wood, energy and waste sectors at national level. The data collected provides key information about the contribution of wood energy to progress made towards achieving SDG7.
Policy Advice	Establishing information systems for Better Forest Policy and Management	This Policy Brief provides basic information for member States on how to harness advances in Information Technology for improved management of forest ecosystems and their services. Forest Policy and Management Support Information Systems (FPMSIS) help to gather forest information, making it accessible, informing decisions, monitoring results and modifying current policies.	FPMSIS can increase operational efficiency, reduce cost, and supply better information, thereby improving forest ecosystem services and State governance. They can also be a strategic tool for economic growth, climate change mitigation policies and provide the increased transparency and participation expected by modern society.

Subprogramme 8: Housing, Land Management and Population

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
Policy Advice	Supporting the digitalization of land registries	<p>The Scenario Study on Future Land Administration in the ECE Region and the publication on “Public-Private Partnership in Land Administration” highlight megatrends such as Artificial Intelligence, crowdsourcing and cybersecurity as they relate to land administration and provide concrete recommendations for developing land administrations.</p> <p>The publication “Digital transformation and land administration – Sustainable practices from the ECE region and beyond”, prepared jointly with the FAO and the International Federation of Surveyors (FIG), provides an action-oriented reference framework for harnessing technology and innovation for unlocking the full potential of land.</p>	<p>The study features strategies for increasing the contribution of land administration to achieving the SDGs in light of the anticipated impacts of climate change, urbanization and green transformation.</p> <p>The publication on PPP in land administration provides case studies and best practices from the ECE region to help national governments raise funds for consolidating forward-looking land administrations that are fit-for-purpose.</p> <p>The publication on digital transformation provides a reference framework for helping land administrations build the ICT infrastructure and digital solutions required for addressing megatrends and achieving the SDGs. Capacity building guidance is provided on digitalization of land registries.</p>
Norms, standards and legal instruments	Key Performance Indicators for Smart Cities	<p>The Key Performance Indicators for Smart Sustainable Cities (KPIs for SSC), a United Nations standard on smart sustainable cities, were developed jointly by ECE and the International Telecommunication Union (ITU). They consist of 112 quantifiable performance measurements for tracking progress toward the achievement of the SDGs. They provide city leaders with a standardized method for data collection and a practical reference framework for an integrated, indivisible and balanced treatment of the SDGs.</p>	<p>The Smart Sustainable Cities’ Profiles feature action-oriented recommendations, developed in consultation with the local and national governments, for greening the cities through, among others, increasing green spaces, improving energy efficiency in buildings and basic utility services and reducing reliance on cars. The Profiles also provide recommendations for improving the city’s ability to finance implementation.</p>
Policy Advice	Smart, Sustainable City Profiles	<p>ECE Smart, Sustainable City Profiles evaluate cities/countries against the KPIs, and provide city leaders with action-oriented recommendations for improving the quality of life of all inhabitants in a manner that is consistent with the 2030 Agenda principle of policy coherence.</p>	<p>Capacity building guidance is provided to help countries implement the recommendations.</p>
Policy Advice	San Marino Declaration on principles for sustainable and inclusive urban	<p>The San Marino Declaration (2022) provides action-oriented principles for bolstering the roles of city mayors, architects, engineers, urban planners, designers, surveyors, building and city managers, developers and infrastructure operators in ensuring sustainable, safe, healthy, socially inclusive, climate-</p>	<p>The principles provide the basis for achieving circularity and green transformation in cities, which are home to over half the world’s population. The principles are ethically equivalent and constitute a manifesto for a global future,</p>

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
	design and architecture in support of sustainable, safe, healthy, socially inclusive, climate-neutral and circular homes, urban infrastructure and cities (The San Marino Declaration)	neutral and encouraging circularity in homes, urban infrastructure and cities.	where digital transformation ensures that no one is left behind.
Policy Advice	People-Smart Sustainable Cities	The COVID-19 pandemic has shown that different cities have different capacities to cope with crises. As summarized in the publication, both the pandemic and the economic crisis caused by lockdown measures, have disproportionately affected certain cities and specific groups of the population; the most vulnerable groups of society have suffered most.	The publication provides policy support and recommendations on the use of the “people-smart sustainable cities” approach.
Policy Advice	Policy Briefs and Seminars on Ageing	Digitalization provides opportunities and challenges for ageing populations, as well as for service provision and social participation of older persons. Policy briefs on “Ageing in Sustainable and Smart Cities” and “Ageing in the Digital Era” address these issues.	The policy briefs support age-friendly design of digitalization and sustainability through analysis, presentation of policy strategies and sharing of good practices from ECE member States.
Policy Advice	2022 Rome Ministerial Declaration	In the outcome document of the 2022 ECE Ministerial Conference on Ageing in Rome, ECE member States set the priorities for ageing-related policies in 2022–2027. They committed to “promoting user-friendly digitalization, enhancing digital skills and literacy to enable older persons to participate in an increasingly digital world, while also ensuring the right to access to information, participation, and services through access to digital devices and the Internet, and to suitable offline or other secure alternatives in user-friendly and accessible formats” (paragraph 25).	In the next five years, ECE countries will continue to seize the opportunities of digitalization in their policy response to population ageing, while ensuring that older persons can fully benefit from its promises and are not left behind in an increasingly digital world.

<i>Category</i>	<i>Tool</i>	<i>Description</i>	<i>Impacts, including for green transformation</i>
		<p>Furthermore, they entrusted the ECE Standing Working Group on Ageing with updating the Regional Implementation Strategy for the Madrid International Plan of Action on Ageing to “adapt ageing-related policy responses to economic, social, and digital transitions and emerging challenges, and developing further instruments to support them” (paragraph 47).</p>	