

**Analysis of efficiency of FMP in Ukraine and
elaboration of a draft "Conceptual programme for
the development of FMP and NFI" considering
Germany and EU experiences**

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About the Project "Sustainable Forestry Implementation" (SFI)

The project "Promotion of multifunctional sustainable forest management planning and implementation in Ukraine" (SFI) is a project established within the framework of the Bilateral Cooperation Programme (BCP) of the Federal Ministry of Agriculture, Food and Regional Identity (BMLEH) with the Ministry of Economy, Environment and Agriculture of Ukraine (MEEA). It is a continuation of activities started in the forest sector within the German-Ukrainian Agriculture Policy Dialogue (APD) forestry component.

The Project is implemented based on an agreement between GFA Group, the general authorised executor of BMEL, and the State Forest Resources Agency of Ukraine (SFRA) since October 2021. On behalf of the GFA Group, the executing agencies - IAK Agrar Consulting GmbH and Unique land use GmbH and are in charge of the implementation jointly with the SFRA.

The project aims to support sustainable forest management in Ukraine and has a working focus on the results in the Forest Policy and National Forest Inventory.

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TABLE OF CONTENTS

Introduction.....	3
PART I. Analysis of the current state of forest management in Ukraine.....	3
1. Legal basis and regulatory framework.....	3
1.1. International regulatory framework.....	5
2. Current status and key challenges.....	6
2.1. Institutional capacity.....	6
2.2. State of data and technology.....	6
2.3. Financial model and its shortcomings.....	7
2.4. Methodological and technological limitations.....	8
2.5. Window of opportunity.....	8
PART II. Conceptual programme until 2035.....	10
3. Context: The EU Forestry Strategy 2030 and its implications for Ukraine.....	10
3.1. Climate change and its impact on Ukrainian forests.....	11
3.3. Strategic vision and objectives.....	11
4. Concern "Ukrainian Forest Planning" - organisational model.....	12
4.1 Legal basis.....	12
4.2. Composition and functions.....	12
4.3. Comparison with international models.....	13
4.4. Market of forest management services.....	14
4.5. Forestry close to nature in the FMP system.....	15
5. Financial model of the Concern.....	16
6. Digital transformation and technologies.....	17
6.1. Unified geoinformation platform.....	17
6.2. Remote sensing of the Earth (RS).....	19
6.3. Interaction of the digital platform with state registers.....	19
7. National forest inventory and international reporting.....	19
8. Interaction with state institutions.....	20
8. Human resource development and scientific partnerships.....	21
PART III. Roadmap, results and risks.....	22
9. Roadmap to 2035.....	22
10. Expected results and key performance indicators (KPIs).....	24
11. Risks and their mitigation.....	25
12. Priority steps for the authorities.....	26
List of sources and references.....	28
Glossary of terms and abbreviations.....	32

Introduction

Ukraine's forest management system is in need of a comprehensive transformation. The combination of four key factors - post-war reconstruction needs, European integration commitments, climate change, and the need for institutional modernisation - creates both an urgent need and a unique opportunity for reform.

Ukraine's forests cover around 10.6 million hectares and are key to climate stability, biodiversity conservation and economic recovery. At the same time, the current system, centred on the State Enterprise Ukrderzhlisproekt, operates under conditions of chronic underfunding, staff shortages and technological lag. As a result, there is a risk of non-compliance with EU requirements: EU REDD Regulation (EUDR, Regulation (EU) 2023/1115), LULUCF Regulation (Regulation (EU) 2018/841) and FOREST EUROPE commitments, which threatens the Ukrainian forestry sector's access to the EU market.

The Conceptual Programme proposes the transformation of the SE "Ukrderzhlisproekt" into the Concern "Ukrainian Forest Planning" (UFP) - a statutory association of legal entities (Article 6 of the Law of Ukraine No. 4196-IX of 09.01.2025) with 100 per cent state participation. The Concern will become the only national centre of competence for forest management (FMP), the State Forest Cadastre, NFI (National Forest Inventory) and integrated forest monitoring on a single digital platform.

i Three stages of implementation:

Stage 1 (2026-2027): Institutional launch - registration of the Concern, updating the regulatory framework, pilot digital projects.

Stage 2 (2028-2031): State forest cadastre, 2nd cycle of NFI, FRA and LULUCF reporting, service market.

Phase 3 (2032-2035): full EUDR compliance, financial self-sufficiency, integration into the European Forest Information System (EFIS).

PART I. Analysis of the current state of forest management in Ukraine

1. Legal basis and regulatory framework

Ukraine's forest management system operates within a comprehensive legal framework that includes national legislation, policy documents and international commitments. Key regulations and their relevance to the FMP/NFI system:

Regulatory act	Relevance to the FMP and NFI system
Forest Code of Ukraine	Defines the principles of forest management; forest cadastre, FMP and NFI

Regulatory act	Relevance to the FMP and NFI system
Resolution of the Cabinet of Ministers of Ukraine No. 112 of 07.02.2023	Procedure for forest management - the main operational regulation; needs to be updated with regard to digital procedures and involvement of private contractors
CMU Resolution No. 848 of 20.06.2007	Procedure for maintaining the State Forest Cadastre; needs to be updated for interoperability with other registers
CMU Resolution No. 392 of 21.04.2021	The procedure for conducting NFI is the basis for international reporting to FAO and FOREST EUROPE
Law No. 554-IX "On National Geospatial Data Infrastructure"	Integration of forest management data into the National Geospatial Data Infrastructure (NGDI); INSPIRE standards (Directive 2007/2/EC)
Law No. 1907-IX "On public electronic registers"	Requirements for the State Forestry and Cadastre as an interoperable public register with open data
EU REDD Regulation (EUDR, Regulation (EU) 2023/1115)	Requires geospatial records of timber origin; Ukraine has a low risk status, but is obliged to provide relevant data for access to the EU market
LULUCF Regulation (Regulation (EU) 2018/841)	Obliges to account for forest carbon stocks; requires reliable NFI data for reporting under the Paris Agreement

Strategic framework. The forest management reform is implemented in the context of three key strategic documents. The first one, the State Forest Management Strategy of Ukraine until 2035 (CMU Resolution No. 1777-p of 29.12.2021), explicitly defines the following priorities: institutional restructuring of the SE "Ukrderzhlisproekt", implementation of NFI on a systematic basis, digitalisation of the State Forestry Cadastre and integration with NFI. The second one, the National Economic Strategy until 2030, considers forests as a strategic resource for green economic recovery and climate neutrality. The third, the EU-Ukraine Association Agreement, obliges Ukraine to harmonise its forestry legislation with current EU law, including the requirements of the EUDR and LULUCF.

Key legal and regulatory issues that hinder the reform:

- The CMU Resolution No. 112 of 07.02.2023 (as amended on 22.09.2023 No. 1017) formally allows the participation of organisations of all forms of ownership in forest management, but does not contain a mechanism for competitive selection of contractors - there are no tender procedures, which in practice preserves the de facto monopoly of the State Enterprise "Ukrderzhlisproekt".

- The legislation does not provide for the status of an "authorised forest management organisation", which makes it impossible to transfer methodological and control functions from the state authorities to a specialised organisation.
- The taxation standards have not been updated to meet the requirements of EUDR and FAO FRA, which makes it impossible to automatically integrate Ukrainian data into international reporting systems.
- The CMU Resolution No. 848 of 20.06.2007 on maintaining the state forest cadastre does not provide for electronic interaction with the State Land Cadastre.

To eliminate these problems, it is necessary to introduce targeted amendments to CMU Resolutions No. 112, No. 848 and No. 392, as well as to develop industry standards for the use of remote sensing, GNSS and API in the FMP and NFI processes.

1.1. International regulatory framework

The international regulatory framework that Ukraine is obliged to implement or is approaching is the most important external factor for the reform. The key elements are described in detail below.

EUDR (EU Deforestation Regulation, Regulation (EU) 2023/1115) - entered into force on 29.06.2023. Operators supplying timber and wood products to the EU market are required to: (1) provide geospatial records of the area of origin with coordinates; (2) declare no deforestation after 31.12.2020; (3) implement a due diligence system. Ukraine has a low-risk country status, but is obliged to maintain reliable and publicly verified geospatial data on all forest areas. Without an up-to-date State Forest Cadastre and NFI, the low-risk status cannot be guaranteed, which could result in the loss of market access for hundreds of companies.

LULUCF (Regulation (EU) 2018/841) - requires Member States and candidate countries to ensure that the LULUCF sector (forests, farmland, peatlands) generates no net emissions. The forestry sector is the largest carbon sink in Ukraine. Reporting requires: time series of NFI data by IPCC pools; verified calculations of growth and decline; accounting tables based on the IPCC 2006 methodology.

FAO FRA (Global Forest Resources Assessment) - carried out every 5 years; Ukraine has been submitting a report since 1990. Ukraine uses extrapolated data, which reduces the credibility of the report. FAO has repeatedly expressed concern about the quality of input data.

FOREST EUROPE (criteria and indicators for sustainable forestry) - Ukraine is a signatory to the Warsaw (2007) and Madrid (2015) Declarative Resolutions and regularly provides data for the pan-European State of the Forests of Europe reports. The level

of detail and reliability of reporting depends on the quality of the NFI and the State Forest Cadastre.

2. Current status and key challenges

2.1. Institutional capacity

As of the beginning of 2026, the SE "Ukrderzhlisproekt" has 224 employees, of which only about 80 are taxation engineers/forest cruisers directly involved in field work. Given the area of 9.7 million hectares of state forests, this is more than 120,000 hectares per specialist - a critically insufficient figure. The average age of field staff exceeds 50 years. Russia's armed aggression has caused significant losses of equipment and restricted access to forests in a number of regions.

Forestry functions are fragmented between the SFRA (management of state-owned enterprises), the Ministry of Economy (policy), the SE "Ukrderzhlisproekt" (FMP, NFI) and scientific institutions (without systematic coordination). This fragmentation leads to duplication, inconsistency of data and a gap between strategic goals and their operational implementation.

2.2. State of data and technology

There is no system for operational monitoring of changes (felling, drying out, fires, damage). Geographic information systems are fragmented, without interoperability and WMS/WFS/API standards.

Direction	Current state	Target state by 2035
Staffing	80 taxation engineers for 9.7 million hectares is critically low; average age >50 years	500-600 specialists; accredited private contractors; certification system
GIS platform	Isolated systems without interoperability; no WMS/WFS/API	Single platform with open geoservices WMS/WFS/API (OGC standards)
International reporting	Outdated taxation data; inconsistency with IPCC and FAO FRA methodology	NFI-1 (2021-2025) - one third of data collected; NFI-2 (2026-2030) - not yet started; annual reporting to FOREST EUROPE; LULUCF module
EUDR compliance	Full traceability system with geo-records for each harvesting site developed and tested	Complete traceability system with geo-records for each billet site

Direction	Current state	Target state by 2035
Financial stability	Dependence on funds from forest users; unstable budgeting	Multi-channel model: state budget (public functions) + management fees + commercial services

⚠ Critical risks due to outdated data:

It is impossible to fulfil EUDR requirements without up-to-date geospatial records of harvesting sites.

FAO FRA and FOREST EUROPE reporting is based on data from 20 years ago - low reliability.

There is no certified carbon module based on NFI for LULUCF reporting.

Loss of trust of international partners threatens technical and financial support for post-war forest restoration.

2.3. The financial model and its shortcomings

The main part of forest management funding is provided by forest users, not the state budget, which leads to uneven coverage: forests without active forest users are effectively left out of the planning system. There are no protected budget items for the NFI, the State Forest Cadastre and international reporting. The mechanism of fair distribution of the burden between different categories of forest users is not defined. There is insufficient use of green financial instruments: GCF, REDD+, EU ETS.

Specific manifestations of financial imbalances in the FMP system:

- Irregular cycles of funding for field and desk-based work lead to the accumulation of outdated data and make it impossible to systematically update forest management materials.
- Limited ability to upgrade hardware and software: server infrastructure, GIS software, licences for specialised analytical systems, field equipment for GNSS measurements.
- The lack of stable funding for the NFI as an international obligation of Ukraine to FAO, FOREST EUROPE and within the framework of LULUCF makes it impossible to complete the reporting in a timely manner.
- The lack of medium-term budget planning (3-5 years) makes it impossible to attract qualified personnel and implement infrastructure projects.
- Inequality of financing conditions between state, municipal and private forest users: a significant part of the costs is compensated by the economic activities of state-owned enterprises, while private and municipal forests remain outside the FMP system.

2.4. Methodological and technological limitations

Despite the adoption of the new Forest Management Planning Procedure (CMU Resolution No. 112 of 07.02.2023), most sectoral instructions, technical regulations and taxation tables remain focused on the forestry paradigms of the last century. The main focus remains on planning of harvesting and timber stock accounting, while the assessment of ecosystem services, carbon functions of forests, recreational potential and role in the water balance remains only formally declared.

Forest inventory methods are still based mainly on manual field measurements. Despite the partial use of orthophotomaps, there is no systematic application of modern remote sensing technologies. The regulations do not contain requirements for the use of Sentinel-1/2, LiDAR or automated classification. There are no standards for the transfer of field data via APIs and metadata according to ISO 19115 and INSPIRE (Directive 2007/2/EC), which makes integration with the National Geospatial Data Infrastructure impossible.

The logging intensity standards and sanitary condition criteria do not take into account modern scientific understanding of forest adaptation to climate change, drought resistance, and massive pest and disease spread. This makes it impossible to use FMPs as a tool for climate adaptation, a key requirement of the EU Forestry Strategy 2030 and the State Forest Management Strategy of Ukraine until 2035.

2.5. Window of opportunity

Despite systemic problems, the current moment is unique for the reform. Four key factors create a favourable context:

European integration commitments - EU candidate status and EUDR and LULUCF commitments create external regulatory pressure and at the same time open access to EU technical assistance, LIFE and Horizon Europe funding. Compliance with the EUDR is a prerequisite for maintaining market access for hundreds of Ukrainian logging and wood processing companies.

Post-war reconstruction - the scale of restoration of forests damaged by armed hostilities (fires, mines, destruction of infrastructure) requires accurate up-to-date data - which justifies investment in NFI and remote sensing. International donors (GIZ, BMEL, FAO, Sida, USAID) are already supporting Ukraine's forestry sector and are ready to expand their assistance, subject to institutional reforms.

Digitalisation of state registers - the introduction of the register of property rights, the State Land Cadastre and the state open data platform creates the technical basis for the integration of the State Forest Cadastre into a single digital space through Trembita.

Reform of state-owned enterprises - the general trend towards optimisation of the public sector and development of market relations in forestry creates institutional readiness for the reorganisation of the SE "Ukrderzhlisproekt".

PART II. Conceptual programme until 2035

3. Context: The EU Forestry Strategy 2030 and its importance for Ukraine

The EU Forestry Strategy 2030, adopted by the European Commission in 2021, defines three strategic directions that directly affect the requirements for the FMP/NFI system of Ukraine as a candidate country for membership:

Strengthening the role of forests in climate policy - forests are seen as a key element in achieving EU climate neutrality by 2050; increasing the area of protected forests to 30% of the total area, of which 10% is strictly protected; and introducing close to nature forestry (CNF) in the remaining productive forests. These goals form the requirements for the FMP and NFI methodology: accounting not only for the tree stock, but also for carbon pools, biodiversity and ecosystem services.

Restoration of degraded forests - the EU's Nature Restoration Law requires the restoration of 3 billion trees by 2030 and the restoration of degraded forest ecosystems. For Ukraine, the post-war restoration of forests damaged by fire, mining and warfare is a national priority that is in line with EU goals.

Digitalisation of monitoring and transparency - The Strategy envisages the creation of the European Forest Information System (EFIS), an integrated EU forest data platform. Member States and candidate countries are expected to provide interoperable datasets in formats suitable for integration into EFIS, the Copernicus Land Monitoring Service and the European Environment Agency (EEA). Ukraine is already facing this technological challenge.

The EU regulatory architecture that Ukraine needs to ensure compliance with includes:

- EUDR (Regulation (EU) 2023/1115) - already applied today; Ukraine has a low-risk country status, but is obliged to maintain geospatial records for all timber harvesting sites.
- LULUCF (Regulation (EU) 2018/841) - accounting of carbon stocks and flows in the forest sector; requires time series of NFI data according to the IPCC methodology;
- FOREST EUROPE - reporting on 7 thematic blocks (area, stocks, health, biodiversity, protective functions, socio-economic functions, legislation and institutions);
- FAO FRA (Global Forest Resources Assessment) - reporting every 5 years.

Thus, the reform of Ukraine's FMP/NFI system is both a domestic need and an international obligation with direct trade and financial implications.

3.1. Climate change and its impact on Ukraine's forests

Climate change is already having a significant impact on Ukraine's forest ecosystems. Key trends recorded over the past two decades:

- Massive drying out of pine plantations in Polissia caused by a combination of droughts, the typographical bark beetle (*Ips typographus*) and root sponge; the area affected is estimated to exceed 200,000 hectares.
- Shift of climatic zones to the north: longer growing season, more days with temperatures above 35°C, fewer frosty days - which affects the species composition of forests and their resilience.
- Increased fire hazard in Polissia, Forest-Steppe and Steppe; risk of large forest fires in the context of demining and war damage.
- Degradation of spruce plantations in the Carpathians: drying out due to drought and the typographical bark beetle; the need for large-scale restoration logging and transition to multi-species plantations.

These trends require a fundamental update of approaches to forest management: The FMP should become a climate adaptation tool, not just a timber harvesting planning tool. In particular, the FMP materials should include: an assessment of the vulnerability of each quarter under climate scenarios (RCP 4.5/8.5); recommendations for transforming unstable monocultures into species plantations; measures to create firebreaks and mineralised strips; and a list of key forest reserves for natural regeneration without intervention.

3.3. Strategic vision and goal

By 2035, Ukraine's forest management system will be transformed into a high-tech, open and scientifically based management decision support system based on accurate, complete and synchronised forest data in a single digital loop: FMP - cadastre (State Forest Cadastre) - NFI - monitoring.

Strategic objectives until 2035:

SO-1. Institutional reform: reorganisation of the State Enterprise "Ukrderzhlisproekt" into the Concern "Ukrainian Forest Planning" - a single centre of competence.

SO-2. Regulatory update: updating of post. CMU No. 112, 848, 392; harmonisation with EUDR and LULUCF.

SO -3. Digital transformation: a single platform of the State Forest Cadastre (WMS/WFS/API); Geoportal of the geographic information system of forest resource management; satellite monitoring Sentinel.

SO -4. NFI and international reporting: two full cycles of NFI; FAO FRA, FOREST EUROPE, LULUCF module, EUDR traceability.

SO -5. Sustainable funding model: state budget for public functions + management fees + competitive market.

SO -6. Personnel development: 500-600 specialists; QA/QC system; partnership with universities; accredited private contractors.

4. Concern "Ukrainian Forest Planning" - organisational model

4.1 Legal basis

The Ukrainian Forest Planning Concern (UFPC), an association of legal entities with 100 percent state participation, is established by a resolution of the Cabinet of Ministers of Ukraine in accordance with Articles 6-8 of the Law of Ukraine No. 4196-IX of 09.01.2025 (concern as a form of association of legal entities) and Articles 4, 6 of the Law No. 185-V of 21.09.2006 "On Management of State-Owned Property" (state management holding company as an alternative form). The participants retain the status of legal entities, vesting the Concern with some of their powers.

⚠ Warnings:

Warning: The term "Concern" is used as a working title. The final legal form - a concern (Article 6 of Law No. 4196-IX) or a state managing holding company (Articles 4, 6 of Law No. 185-V) - is determined by the results of a legal opinion. Necessary steps: (1) legal opinion; (2) approval of the package of amendments to the regulations; (3) draft resolution of the Cabinet of Ministers; (4) charters of the LLC members.

4.2. Composition and functions

Figure 1. Organisational structure of the Concern "Ukrainian Forest Planning"





Subject	Functions
Supervisory Board	Strategic oversight; approval of plans, budgets and reports; composition - Ministry of Economy, State Forest Resources Agency, National Academy of Sciences of Ukraine, National Academy of Agrarian Sciences of Ukraine, international partners (advisory)
Ukrainian Forest Planning LLC (management company)	Management of the Concern; FMP and NFI methodology and standards; quality control (QA/QC); accreditation of contractors; digital platform; human resources, legal, financial and accounting services
National Forest Inventory LLC	NFI according to FAO and EU standards; international reporting: FAO FRA, FOREST EUROPE, LULUCF, EUDR; scientific and methodological support
State Forest Cadastre LLC	Maintenance and updating of the State Forest Cadastre (CMU Resolution No. 848); interoperability with the SLC, the registry of rights, EDI; public WMS geo-service
Forestry expeditions (LLC)	Field and camera work; regional coverage; specialised surveys
Private contractors (external)	Involved through open tenders; accredited by the Concern; transmit data via API interface; subject to Concern's QA/QC

4.3. Comparison with international models

The proposed model of the Concern was developed based on the analysis of experience of three EU countries with the most relevant models for Ukraine:

Parameter	Poland (Lasy Państwowe)	Latvia (LVM)	Slovakia (LESY SR)	Concern "UFP"
Legal form	State-owned enterprise	JSC 100% state-owned	JSC 100% state-owned.	Concern (Article 6 of Law No. 4196-IX), 100% state-owned.
Area	~7.5 million hectares	~1.6 million hectares	~1.95 million hectares	~9.7 million ha (state forests)
Financing	Self-financing	Profitable model	Self-financing model	State budget + management fees
Private sector	Limited	Active involvement	Limited	Key role: competitive tendering
NFI / reporting	Centralised	Centralised	Centralised	Separate LLC "NFI"
Digital platform	Regional systems	Centralised	Regional systems	Single WMS/WFS/API platform; open data

The Polish model of Lasy Państwowe demonstrates the effectiveness of centralised methodological management with operational independence of regional units and full self-financing. Latvia's LVM proves the profitability of a 100% state-owned structure even in a limited area. The Slovak LESY SR confirms the efficiency of combining SFEs and the forestry function. For Ukraine, the proposed model has been adapted to take into account the larger area, the separate functioning of FMP and forestry, and the need for the NFI system through a separate centre - NFI LLC.

4.4. Market of forestry services

The Concern introduces a three-tier market model of service provision with a clear division of functions:

The Concern (methodology and control) - develops standards and technical regulations; administers the State Forestry; carries out QA/QC and verification of results; maintains a register of accredited contractors; ensures international reporting (FAO FRA, FOREST EUROPE, LULUCF, EUDR).

Private contractors are legal entities and individual entrepreneurs accredited by the Concern; they perform field surveying and desk-based processing on a competitive basis through open tenders; transfer data through a secure API interface in GeoJSON and GML formats in accordance with ISO 19115 and the INSPIRE directive.

Forest users (customers) - state, municipal, private - independently select contractors; finance the work; receive verified materials as an official basis for forest management.

Service cycle: (1) accreditation of the contractor for 3-5 years - compliance with qualification and technical requirements; (2) open contracting with the forest user; (3) field stage - collection of taxation data in standardised digital forms; (4) desk stage - processing, calculations, mapping; (5) automatic validation in the Contractor's Office; (6) selective field verification by the Concern ($\geq 5\%$); (7) approval and integration into the State Forest Cadastre.

Compared to the current monopoly model, the new system provides: competition between contractors - an incentive to improve quality and reduce costs; increase in overall capacity - overcoming the staff shortage of the SE "Ukrderzhlisproekt"; a single methodological basis - the Concern guarantees data compatibility regardless of the contractor; transparency - a public register of accredited contractors and tender results.

4.5. Close-to-nature forestry in the FMP system

The concept enshrines the principles of close-to-nature forestry as a strategic direction for planning forestry activities, which is in line with the EU Forest Strategy 2030 and the INTEGRATE/ProSilva network. Forest management documentation should include:

- Prioritisation of natural regeneration over artificial regeneration; preservation of microhabitats - old trees, rotten logs, hollows, rare herbaceous plants.
- Gradual formation of multi-age, multi-tiered and multi-species plantations instead of single-age monocultures.
- Minimising clear-cutting: transition to selective, gradual or group-selective methods.
- Modelling the dynamics of forest ecosystems under climate scenarios (RCP 4.5/8.5) to assess vulnerability and adaptive capacity.
- Harmonisation of planning decisions with the requirements of the nature reserve fund and the Emerald Network, which will be transformed into the Natura 2000 network upon Ukraine's accession to the EU.
- Social factors: traditional use of forests by communities, recreational functions, green infrastructure, protection of cultural heritage.

5. Financial model of the Concern

Fig. 2. Financial model of the Ukrainian Forest Planning Concern

Source of funding	Areas of use	Legal basis
State budget	FMP, NFI, SFRA, international reporting, methodology, QA/QC, digital platform	<i>Art. 22, 51 of the BC; CMU No. 392, 848</i>
Payment from the Concern's participants	Operating activities of the managing LLC: management, methodology, IT, audit (1.5-5% of turnover)	<i>Article 39 of the TCU; arm's length</i>
Funds of forest users	FMP works of service nature; competitive engagement of accredited contractors	<i>CMU No. 112; open tenders</i>
International technical assistance	Digital transformation, equipment, training, pilot projects	<i>LIFE, Horizon EU, FAO, GCF, GIZ, USAID</i>
"Green financial instruments	Carbon finance, ecosystem services markets, climate programmes	<i>REDD+, EU ETS, GCF</i>
TOGETHER	<i>Self-sustaining model; reduced dependence on budget in phase 3 (2031-2035)</i>	<i>Reference: Lasy Państwowe (PL), LVM (LV), ÖBf (AT)</i>

Source.	Functions	Grounds and comments
State budget	FMP, NFI, State Forest Cadastre, international reporting, methodology, QA/QC, digital platform	Public functions of the state; Art. 22, 51 of the Budget Code; post. CMU regulations No. 392, 848; a prerequisite for FAO FRA, FOREST EUROPE, LULUCF
Payment for management services from participants	Operating activities of the management company: management, methodology, IT support, audit	Article 39 of the Tax Code (arm's length principle); approved by the Supervisory Board;

Source.	Functions	Grounds and comments
Funds from forest users (contractual)	FMP works of a service nature commissioned by specific forest users	Post. CMU No. 112; competitive engagement of accredited contractors through open tenders
International technical assistance	Digital transformation, equipment, training, pilot projects	EU programmes (LIFE, Horizon Europe), FAO, Green Climate Fund (GCF), GEF, GIZ, Sida, USAID
"Green financial instruments	Carbon finance, ecosystem services markets, climate programmes	REDD+, EU ETS (Emissions Trading System), GCF; a promising source for post-war reforestation

The management fee is calculated in proportion to the turnover of the participants on an arm's length basis (market pricing between related parties in accordance with Article 39 of the Tax Code of Ukraine).

i International benchmarks for management fees:

Lasy Państwowe (Poland): supra-forestry enterprises transfer 2-5% of net income to the central fund on a quarterly basis.

Österreichische Bundesforste (Austria): central office expenses are 3-4% of the group's consolidated turnover.

General practice (Deloitte, KPMG): intra-group management fees are 1.5-5% of the subsidiaries' turnover.

6. Digital transformation and technology

6.1. Unified geoinformation platform

Figure 3. Digital platform architecture and data flows of the Concern

DATA SOURCES	UFPC DIGITAL PLATFORM	DATA CONSUMERS
Sentinel-1/2 (Copernicus) NFI/FMP field measurements GPS / LiDAR surveys	EU SFC - Unified System of the State Forestry and Cadastre (CMU No. 848; Law No. 554-IX)	State Forest Resources Agency Ministry of Ecology and

		Natural Resources Ministry of Agrarian Policy
Forest management planning data (FMP) NFI data Monitoring of the sanitary condition	WMS/WFS geoportal (OGC; GML; ISO 19115; GeoJSON)	FAO (FRA reporting) FOREST EUROPE LULUCF / EUDR
Government customers (SLC, registry of rights, Trembita)	Carbon module (IPCC methodology; integration with NFI)	Carbon markets (EU ETS, REDD+, GCF)
Private contractors (API interface)	Executive office (API; QA/QC auto-authorisation; audit)	Public access (open data; OpenData)
Key principles: Open standards (OGC/ISO) - Interoperability (API-first) - INSPIRE Directive - GDPR-compliance		

The digital foundation of the Concern consists of five interconnected components:

Unified State Forest Cadastre System (EU SFC) - developed in accordance with the post. CMU No. 848, Law No. 554-IX (NGDI), Law No. 1907-IX (public registers); bilateral interaction with the SFC, the register of property rights, and the EOD system; connection to Trembita.

Geoportal of the Geoinformation System of Forest Resources Management of Ukraine is a public WMS/WFS platform based on OGC standards; it displays data from the State Forest Cadastre, FMP, NFI and monitoring for authorities, forest users, and the public.

Satellite monitoring - systematic use of Sentinel-1 (SAR) and Sentinel-2 (optics) of the Copernicus programme; automated detection of logging, fires, drying out, war damage; NDVI and NBR indices.

Carbon module - modelling of biomass dynamics and carbon flows according to the IPCC methodology; integration with NFI for reporting under LULUCF and the Paris Agreement.

Executive office - a secure API interface with automatic data validation tools (QA/QC); audit log; transfer standards: GeoJSON, GML (Geography Markup Language), ISO 19115 metadata.

6.2. Remote sensing of the Earth (RS)

The systematic application of remote sensing technologies is a fundamental change from the current practice of manual field measurements:

- Mandatory use of Sentinel-1/2 for the initial update of forest cover between FMP cycles.
- LiDAR for three-dimensional mapping and assessment of timber stocks in priority areas.
- UAVs (drones) for detailed surveys of individual sites, including in post-conflict areas.
- Automated processing using machine learning for forest type classification and damage mapping.
- Industry standards for the use of remote sensing in FMPs and NFIs: mandatory metadata, georeferencing accuracy, minimum resolution.

The use of remote sensing requires the development and approval of new industry guidelines in partnership with the State Space Agency of Ukraine and the EU Copernicus User Uptake programme. These guidelines should define: the rules for using free Sentinel data, the procedure for ordering commercial imagery with higher resolution, requirements for field crews' equipment (GNSS receivers, offline GIS tablets), and the format for transferring field measurements to the "Executive Office".

6.3. Interaction of the digital platform with state registers

To ensure the legal and technical reliability of the State Forest Cadastre data, two-way automated interaction through secure inter-registry exchange is envisaged:

- With the State Land Cadastre - transfer of forest plot boundaries; obtaining data on changes in land designation; verification of intersections and adjacencies.
- With the Register of Property Rights - verification of legal status; identification of conflicts between forest and land rights.
- With EDI - transfer of data on timber harvesting volumes for EUDR traceability; verification of compliance with the forest plan.
- With Trembita - a secure technological gateway for all inter-registry exchanges (CMU Resolution No. 483).
- With the Geoportal (NIGD) - publication of metadata and thematic layers in accordance with Law No. 554-IX and INSPIRE.

7. National forest inventory and international reporting

The NFI (National Forest Inventory) is the core function of the Concern and the only official basis for international reporting on the state of Ukraine's forests. National Forest Inventory LLC is responsible for:

- FAO FRA - global reporting every 5 years; requires data on area, stock, growth, age structure, carbon stocks.
- FOREST EUROPE - reporting on criteria and indicators of sustainable forest management.
- LULUCF (Regulation (EU) 2018/841) - accounting of carbon stocks and flows to fulfil the obligations of the Paris Agreement.
- EUDR (Regulation (EU) 2023/1115) is a basic mapping and statistical framework for the timber traceability system.

Two full NFI cycles are expected to be completed by 2035. The first NFI cycle (2021-2025) has been completed. The second cycle (2026-2030) will be conducted in accordance with the CMU Resolution No. 392; the second cycle will provide comparative dynamics and consolidate Ukraine as a reliable international partner.

NFI methodology - The sample design of the NFI was developed in accordance with the requirements of CMU Resolution No. 392 with adaptation to FOREST EUROPE standards and IPCC (Intergovernmental Panel on Climate Change) methodological guidelines for the LULUCF sector.

Publication of NFI results. Aggregated results are published in the form of open data (in accordance with Law No. 1907-IX), cartographic materials through the forest geoportal and analytical dashboards. The datasets are in formats compatible with the European Forest Information System (EFIS), Global Forest Watch and Copernicus Land Monitoring Service.

8. Interaction with state institutions

The Concern functions as a methodological and technical centre in the state forest management system, interacting with key institutions:

The Ministry of Economy (Ministry of Economy, Environment and Agriculture of Ukraine) - receives analytics of the forests state for the formation of forest and climate policy; approves strategic goals of the FMP/NFI system development; monitors the fulfilment of EUDR, LULUCF, FOREST EUROPE obligations.

The State Forest Resources Agency (SFRA) is the authorised management body of the Concern; it carries out state orders for public functions of NFI and cadastre; forms the Supervisory Board; monitors compliance with industry standards.

The State Geocadastre (SGC) - bilateral automated interaction through Trembita: The Concern transmits the boundaries of forest plots, receives data on changes in land use designation; synchronisation ensures the unity of geospatial records for EUDR.

NGDI (National Geospatial Data Infrastructure) - The State Forest Cadastre is a part of NGDI in accordance with the Law No. 554-IX; data is published through WMS/WFS geo-services according to INSPIRE standards (Directive 2007/2/EC).

State Statistics Service - The Concern provides aggregated NFI data for state forest statistics and reporting on sustainable development goals.

Scientific institutions (NAS, NAAS, URIFFM) - partnership in the development of updated taxation tables, models of plantation growth in the context of climate change, methods for assessing carbon pools, habitat maps for Natura 2000 and the Emerald Network.

Analytical function. The Concern annually prepares: (1) a report on the state and dynamics of the forest fund for the Government and the Verkhovna Rada; (2) calculations of carbon balances by LULUCF categories; (3) analysis of risks for forests (pests, droughts, fires, climate change) and scenarios of adaptation measures; (4) materials for national climate change adaptation plans and biodiversity conservation strategies.

8. Human resource development and scientific partnerships

Effective implementation of the Concept is impossible without building human resources capacity. It is envisaged:

- Increase in staff from 224 (2026) to 500-600 specialists (2035): new positions - GIS analyst, remote sensing specialist, forest modelling specialist, carbon finance specialist (REDD+/GCF).
- System of contractors' admission through accreditation by the Concern (instead of licensing): qualification requirements and QA/QC standards; accreditation of certification bodies through NAAU (National Accreditation Agency of Ukraine).
- Continuous professional development: advanced training of field surveyors, GIS analysts, remote sensing and carbon monitoring specialists; online and face-to-face training modules.
- Partnership with the Institute of Forestry of the National Academy of Sciences of Ukraine, Ukrainian Research Institute of Forestry and Forest Melioration, and specialised university departments - joint methodologies, scientific publications, participation in IUFRO (International Union of Forest Research Organisations) and EFI.
- Participation in Horizon Europe, GCF, Global Forest Watch, EU Forest Information System programmes; international internships in Poland (Instytut Badawczy Leśnictwa), Finland (Luke), and Austria (BFW).
- Competitive remuneration: reaching a level of salaries by 2030 that ensures the attraction of young specialists - engineers, GIS analysts, programmers.

PART III. Roadmap, results and risks

9. Roadmap until 2035

Figure 4. Transformation roadmap until 2035

Stage	Timeframe	Key tasks	Expected result
Stage 1 Establishment	2026- 2027	<ul style="list-style-type: none"> - Reorganisation of the SE "Ukrderzhlisproekt" into the Concern "UFP" (Law No. 4196-IX) - Registration of LLC; internal FMP/NFI standards - Launch of the Unified State Forest Cadastre System (basic version) - First competitive tenders; accreditation of contractors - Development of taxation standards (EUDR/FAO) 	<i>Legally established Concern; first tenders; basic digital platform; regulatory framework</i>
Stage 2 Development	2028- 2030	<ul style="list-style-type: none"> - NFI cycle 2 (full coverage of 9.7 million hectares) - WMS/WFS geoportal in open access - Integration of the SFRA with Trembita and SLC - Launch of the carbon module (IPCC) - Training of 50+ inventory engineers 	<i>NFI cycle 2 completed; EUDR compliant; public data online; 50+ specialists</i>
Stage 3 Maturity	2031- 2035	<ul style="list-style-type: none"> - Self-sufficient financial model; NFI cycle 3 - Full compliance with LULUCF / EUDR / FAO FRA - Integration into the EU Forest Information System (FISE) - Preparation of Emerald Network → Natura 2000 - Forest cadastre - part of NFI 	<i>Self-sufficient Concern; full EU compliance; EU accession readiness</i>

Stage / Timeframe	Key tasks	Responsibilities	Financing
Stage 1 2026-2027 Institutional launch	<ul style="list-style-type: none"> - Resolution of the Cabinet of Ministers of Ukraine on reorganisation of the SE "Ukrderzhlisproekt" into the Concern - Registration of LLCs (all); formation of the Supervisory Board - Update of the post. CMU REGULATIONS NO. 112, 848, 392, 625 - Deployment of the pilot of the unified system of the State Forestry and Cadastre - Pilot projects of remote sensing (Sentinel-1/2, LiDAR) - First cycle of training: tax collectors, GIS analysts 	CMU, Ministry of Economy, SFRA, Concern	State budget; international technical assistance
Stage 2 2028-2031 Scaling up	<ul style="list-style-type: none"> - 100% of forest users are connected to the State Forest Cadastre - Forest geoportal (WMS/WFS/API) in open access - NFI-1 (2021-2025) ✓; FRA 2025 published. - First LULUCF reporting; calibration of the carbon module - 50+ accredited private contractors - Satellite monitoring of all forested areas 	Concern, NFI LLC, SFC LLC	State budget; GCF; EU LIFE; funds of forest users
Stage 3 2032-2035 Optimisation	<ul style="list-style-type: none"> - NFI cycle 2 (2026-2030); comparative dynamics - Full compliance with EUDR: traceability system for each plot 	Concern, all LLCs	Management fees + commercial services (not dependent on project funding)

Stage / Timeframe	Key tasks	Responsibilities	Financing
	<ul style="list-style-type: none"> - Financial self-sufficiency of the Concern's operating unit - 100+ accredited contractors; 30-40% of field works are performed by private contractors - Integration into the European Forest Information System (EFIS) - Annual public report; open data 		

10. Expected results and key performance indicators (KPIs)

By 2035, the implementation of the Conceptual Programme will ensure:

1. **Institutional** - the UFP Concern operates as a single national centre of competence for FMP/NFI/cadastre/monitoring.
2. **Digital** - State Forest Cadastre covers 100% of forest users; geoportal of forests (WMS/WFS/API) is in open access.
3. **Scientific** - **NFI Cycle 1 (2021-2025) completed; Cycle 2 (2026-2030) completed; Ukraine fulfils the obligations of FAO FRA, FOREST EUROPE, LULUCF, EUDR.**
4. **Market** - Competitive market: 100+ accredited contractors; 30-40% of field work is done by private contractors.
5. **Financial** - Financial self-sufficiency of the operating unit without dependence on project financing.
6. **Transparency** - Open data: public report on the state of forests annually; geo-records for EUDR traceability.

Direction	Indicator	Timeframe	Measurement
Institutional	Concern is registered; 8 LLCs are operational	2026	State registration; decision of the CMU
Regulatory	Post. No. 112, 848, 392 of the Cabinet of Ministers of	2027	Official gazette

Direction	Indicator	Timeframe	Measurement
	Ukraine have been updated and entered into force		
Cadastral	100% of permanent forest users registered in the State Forestry Cadastre	2030	Register of the Concern
NFI - cycle 1	NFI-1 (2021-2025) is completed;	2025	Confirmation by FAO
NFI - cycle 2	Completed; 100% of available forest area covered	2035	Internal audit + FAO
Digital	Geo-portal (WMS/WFS/API) + satellite monitoring - full coverage	2030	Technical audit
Market-based	50+ accredited contractors; share of private contractors in field work $\geq 30\%$	2031	Register of accredited
Financial	Concern's operating budget is covered without dependence on project financing	2035	Financial audit
EUDR	Traceability system for all sites; Ukraine - low-risk status confirmed	2030	EC letters

11. Risks and their mitigation

The programme provides for systematic risk management in four categories. The Supervisory Board reviews the risk register annually and publishes the results in the Concern's annual report.

Military risks - restriction of access to forests in the areas of military operations and adjacent areas; risk of damage to equipment, office premises and death of specialists.

Mitigation measures: prioritisation of work in safe regions; use of Sentinel-1/2, LiDAR and UAVs for inaccessible areas; backup of all collected data in several secure data centres (in accordance with CERT-UA requirements); insurance of personnel and equipment.

Institutional risks - delays in the adoption of regulations (CMU resolution, changes to sectoral instructions); resistance of some staff of the SE "Ukrderzhlisproekt" to the reorganisation.

Mitigating measures parallel preparation of a full package of regulations; involvement of relevant committees of the Verkhovna Rada and international partners in legal support; transparent communication campaign explaining the benefits of the new model; employment guarantees for all employees during the transition period; involvement of experienced employees in the development of new regulations.

Financial risks - insufficient budget funding for the NFI and the State Forest Cadastre; delays in international assistance; lower than expected commercial turnover of participants.

Mitigation measures: legislative consolidation of protected budget items for public functions; diversification of sources through GCF, EU LIFE, REDD+; medium-term budget planning for 3-5 years; creation of the Concern's reserve fund (3-6 months of operating expenses).

Technological and cybersecurity risks - difficulties in technical integration of the State Forest Cadastre with the SFC and Trembita; cyber incidents; data loss.

Mitigation measures: phased deployment of the platform with mandatory piloting before scaling; involvement of technical assistance from EFI, FAO, GIZ at the design stage; compliance with CERT-UA cybersecurity standards; encryption and geographically distributed backup of all forest data.

12. Priority steps for the authorities

⚡ For the Cabinet of Ministers of Ukraine - immediately:

1. Adopt a resolution on the reorganisation of the SE "Ukrderzhlisproekt" into the Concern "UFP" with the definition of powers and sources of funding.
2. To amend the post. No. 112, 848, 392 of the Cabinet of Ministers of Ukraine regarding digital procedures, engagement of private contractors, EUDR and LULUCF requirements.
3. Approve the medium-term budget programme for the NFI and the State Forest Cadastre for 2026-2030.

For the Ministry of Economy / State Forest Resources Agency:

1. Order a legal opinion on the optimal organisational and legal form of the Concern.
2. Develop charters of all LLCs and constituent documents of the Concern.
3. Form the Supervisory Board; include the public functions of the Concern in the state order for 2026.

4. Initiate negotiations with FAO, GIZ, EFI on technical and financial support for NFI cycles.

i For international partners (FAO, GIZ, Sida, USAID, EFI):

Technical support for the development of the Unified State Forest Cadastre System and updating of the FMP and NFI methodologies.

Training: GIS analysts, specialists in remote sensing, carbon monitoring, EUDR compliance.

Involvement of GCF, EU LIFE, Horizon Europe for equipment modernisation and pilot projects.

List of sources and references

I. Legislation of Ukraine

1. Forestry Code of Ukraine dated 21.01.1994 No. 3852-XII (as amended as of 31.10.2025) - URL: <https://zakon.rada.gov.ua/laws/show/3852-12>.
2. Budget Code of Ukraine of 08.07.2010 No. 2456-VI (as amended). Articles 22, 51. - URL: <https://zakon.rada.gov.ua/laws/show/2456-17>.
3. Tax Code of Ukraine dated 02.12.2010 No. 2755-VI (as amended). Art. 39 (transfer pricing, arm's length principle) - URL: <https://zakon.rada.gov.ua/laws/show/2755-17>.
4. Law of Ukraine of 21.09.2006 No. 185-V "On Management of State-Owned Property" (as amended). Articles 4, 6. - URL: <https://zakon.rada.gov.ua/laws/show/185-16>.
5. Law of Ukraine of 13.07.2020 No. 554-IX "On the National Geospatial Data Infrastructure." - URL: <https://zakon.rada.gov.ua/laws/show/554-20>.
6. Law of Ukraine of 20.07.2021 No. 1907-IX "On Public Electronic Registers." - URL: <https://zakon.rada.gov.ua/laws/show/1907-20>.
7. Law of Ukraine of 09.01.2025 No. 4196-IX "On Peculiarities of Regulation of Activities of Legal Entities of Certain Organisational and Legal Forms in the Transition Period and Associations of Legal Entities". Articles 6-8. - URL: <https://zakon.rada.gov.ua/laws/show/4196-20>.

II. By-laws and regulations of Ukraine

8. Resolution of the Cabinet of Ministers of Ukraine of 20.06.2007 No. 848 "On Approval of the Procedure for Maintaining the State Forest Cadastre." - URL: <https://zakon.rada.gov.ua/laws/show/848-2007-%D0%BF>.
9. CMU Resolution of 21.04.2021 No. 392 "On Approval of the Procedure for Conducting the National Forest Inventory." - URL: <https://zakon.rada.gov.ua/laws/show/392-2021-%D0%BF>.
10. Resolution of the CMU of 07.02.2023 No. 112 "On Approval of the Procedure for Forest Management" (as amended on 22.09.2023 No. 1017): <https://zakon.rada.gov.ua/laws/show/112-2023-%D0%BF>
11. Resolution of the CMU of 17.03.2022 No. 483 "Some issues of electronic data exchange" (Trembita Technology Gateway): <https://zakon.rada.gov.ua/laws/show/483-2022-%D0%BF>.
12. Resolution of the CMU of 18.05.2011 No. 625 "On Approval of the List of Activities Related to Environmental Protection Measures" (List of Measures Financed from the State Budget): <https://zakon.rada.gov.ua/laws/show/625-2011-%D0%BF>.
13. Order of the Cabinet of Ministers of Ukraine of 29.12.2021 No. 1777-r "On Approval of the State Forest Management Strategy of Ukraine until 2035" (as amended on 22.09.2023 No. 840-r): <https://zakon.rada.gov.ua/laws/show/1777-2021-%D1%80>

III. European Union law

14. Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest

degradation (EUDR). - OJ L 150, 09.06.2023. - URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R1115>.

15. Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework (LULUCF). - OJ L 156, 19.06.2018. - URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32018R0841>.
16. Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE). - OJ L 108, 25.04.2007. - URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007L0002>.
17. Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing a framework for achieving climate neutrality (European Climate Law). - OJ L 243, 09.07.2021. - URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119>.

IV. International treaties and agreements

18. The Association Agreement between Ukraine, on the one hand, and the European Union, the European Atomic Energy Community and their Member States, on the other hand: signed on 21.03.2014 and 27.06.2014, entered into force on 01.09.2017: https://zakon.rada.gov.ua/laws/show/984_011.
19. Paris Agreement: adopted at COP21 of the UNFCCC on 12 December 2015, entered into force on 04 November 2016. Ratified by the Verkhovna Rada of Ukraine on 14.07.2016 No. 1469-VIII.
20. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), 1979 (signed by Ukraine in 1996) is the legal basis of the Emerald Network.

V. Strategic and programme documents of the European Union

21. European Commission. Communication COM(2021) 572 final. New EU Forest Strategy for 2030. Brussels, 16.07.2021. - URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0572>.
22. European Commission. Proposal for a Regulation on Nature Restoration [Nature Restoration Law]. COM(2022) 304 final. Brussels, 22.06.2022. - URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2022:304:FIN>.
23. European Environment Agency (EEA). Copernicus Land Monitoring Service - Forest information. - URL: <https://land.copernicus.eu/en/products/high-resolution-layer-forests>.
24. European Forest Institute (EFI). European Forest Information System (EFIS/FISE). - URL: <https://efi.int/knowledge/databases/efis>.

VI. International standards and methodological guidelines

25. IPCC (Intergovernmental Panel on Climate Change). 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4: Agriculture, Forestry and Other Land Use / Eggleston H.S., Buendia L., Miwa K., Ngara T., Tanabe K. (eds). - IGES, Japan, 2006.
26. FAO (Food and Agriculture Organisation of the United Nations). Global Forest Resources Assessment 2025: Main Report. - Rome: FAO, 2025. - URL: <https://www.fao.org/forest-resources-assessment>.

27. FOREST EUROPE. State of Europe's Forests 2020. Ministerial Conference on the Protection of Forests in Europe - FOREST EUROPE. Bratislava, 2021. - URL: <https://foresteurope.org/state-of-europes-forests/>.
28. FOREST EUROPE. Warsaw Declaration and Resolutions. Fifth Ministerial Conference on the Protection of Forests in Europe "Forests for Quality of Life". Warsaw, 5-7 November 2007. - URL: <https://foresteurope.org/about/ministerial-conferences/warsaw/>.
29. FOREST EUROPE. Madrid Ministerial Declaration. Seventh Ministerial Conference on the Protection of Forests in Europe. Madrid, 20-21 October 2015. - URL: <https://foresteurope.org/about/ministerial-conferences/madrid-2015/>.
30. ISO 19115-1:2014 / AMD 1:2018. Geographic information - Metadata - Part 1: Fundamentals. - Geneva: ISO, 2014.
31. OGC (Open Geospatial Consortium). OpenGIS Web Map Server Implementation Specification (WMS 1.3.0). - OGC 06-042, 2006. - URL: <https://www.ogc.org/standard/wms/>.
32. OGC (Open Geospatial Consortium). OpenGIS Web Feature Service (WFS) Implementation Standard (2.0.0). - OGC 09-025r2, 2010. - URL: <https://www.ogc.org/standard/wfs/>.
33. OGC (Open Geospatial Consortium). Geography Markup Language (GML) Encoding Standard (3.2.1). - OGC 07-036, 2007. - URL: <https://www.ogc.org/standard/gml/>.

VII. Comparative institutional models and practices

34. Lasy Państwowe (State Forests of Poland). Annual Report / Raport Roczny PGL Lasy Państwowe. - Warszawa, 2023. - URL: <https://www.lasy.gov.pl/pl/informacje/publikacje/raporty-roczne>.
35. Latvijas valsts meži (LVM). Annual Report 2023. - Riga: AS Latvijas valsts meži, 2024. - URL: <https://www.lvm.lv/en/investors/annual-report>.
36. LESY Slovenskej Republiky, s.p. Výročná správa 2023. - Zvolen: LESY SR, 2024. - URL: <https://www.lesy.sk/o-nas/vyrocne-spravy/>.
37. Österreichische Bundesforste AG (ÖBf). Nachhaltigkeitsbericht / Annual Report 2023. - Purkersdorf: ÖBf, 2024. - URL: <https://www.bundesforste.at/ueber-uns/berichte-publikationen.html>.
38. Instytut Badawczy Leśnictwa (IBL / Forest Research Institute, Poland). - URL: <https://www.ibles.pl>.
39. Natural Resources Institute Finland (Luke / Luonnonvarakeskus). - URL: <https://www.luke.fi/en>.
40. Bundesforschungs- und Ausbildungszentrum für Wald, Naturgefahren und Landschaft (BFW, Österreich). - URL: <https://www.bfw.gv.at>.
41. European Forest Institute (EFI). About EFI. - Joensuu: EFI. - URL: <https://efi.int/about-efi>.
42. Deloitte. Transfer Pricing: Intragroup Services. Benchmarking Management Fee Rates. - Deloitte Touche Tohmatsu, 2022.
43. KPMG. Global Transfer Pricing Review: Management Charges and Services Fees. - KPMG International, 2023.

VIII. Scientific and methodological sources

44. IUFRO (International Union of Forest Research Organisations). Global Forest Expert Panels Report: Forests and Climate Change. - Vienna: IUFRO, 2023. - URL: <https://www.iufro.org/science/gfep/>.
45. INTEGRATE Network / ProSilva Europe. Close-to-Nature Forest Management: Principles and Application. - EFI, 2021. - URL: <https://integrate-network.eu>.
46. Global Forest Watch. Forest Monitoring Platform. - World Resources Institute. - URL: <https://www.globalforestwatch.org>.
47. Copernicus (ESA / European Commission). Sentinel-1 and Sentinel-2 Mission Guide. - ESA, 2023. - URL: <https://sentinels.copernicus.eu/web/sentinel/missions>.
48. IPCC. Climate Change 2021: The Physical Science Basis (AR6 WGI). Contribution of Working Group I to the Sixth Assessment Report. - Cambridge University Press, 2021. (RCP 4.5/8.5 / SSP climate scenarios)
49. Institute of Forestry of the National Academy of Sciences of Ukraine. Scientific papers. - Kharkiv: IL NANU. - URL: <http://forestinstitute.com.ua>.
50. Ukrainian Research Institute of Forestry and Forest Melioration named after G.M. Vysotsky. - Kharkiv: UkrRIFM. - URL: <https://ukrndilga.com.ua>.

IX. International technical assistance programmes and financial instruments

51. GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit). Forest Programme Ukraine. - Bonn/Eschborn: GIZ. - URL: <https://www.giz.de/en/worldwide/352.html>.
52. BMEL (Bundesministerium für Ernährung und Landwirtschaft). International Forest Policy and Ukraine Support. - Berlin: BMEL. - URL: https://www.bmel.de/EN/topics/forests/forests_node.html.
53. FAO. Support to Forestry Sector in Ukraine. - Rome: FAO. - URL: <https://www.fao.org/ukraine/en/>.
54. Green Climate Fund (GCF). REDD+ and Forest Landscape Restoration Programmes. - Incheon: GCF. - URL: <https://www.greenclimate.fund/themes/forests>.
55. EU LIFE Programme. Nature and Biodiversity. - European Commission. - URL: https://cinea.ec.europa.eu/programmes/life_en.
56. Horizon Europe. Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment. - European Commission. - URL: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en.
57. REDD+ (Reducing Emissions from Deforestation and Forest Degradation). UNFCCC REDD+ Web Platform: <https://redd.unfccc.int>.
58. EU ETS (EU Emissions Trading System). - European Commission. - URL: https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

Glossary of terms and abbreviations

All abbreviations and acronyms are explained the first time they are used in the text. Below is a summary glossary for the convenience of the reader. EU Regulations are listed with their official number and common English abbreviation.

Term / Abbreviation	Decoding and explanation
EUDR (EU Deforestation Regulation)	EU Regulation on the prevention of deforestation - Regulation (EU) 2023/1115. It came into force on 29.06.2023. Requires operators to confirm the absence of deforestation with a geospatial reference. Ukraine is a low-risk country.
LULUCF (Land Use, Land-Use Change and Forestry)	The LULUCF Regulation is Regulation (EU) 2018/841 on land use, land-use change and forestry. Regulates the accounting of carbon stocks and flows in forests to fulfil the obligations of the Paris Agreement.
FAO FRA (Forest Resources Assessment)	FAO's Global Forest Resources Assessment - reporting every 5 years; requires NFI data on forest area, timber stock, growth, age structure, carbon stocks.
FOREST EUROPE	Ministerial Conference on the Protection of Europe's Forests - intergovernmental process; criteria and indicators (C&I) for sustainable forest management; Ukraine has signed the Minsk Resolutions.
NFI (National Forest Inventory)	National Forest Inventory is a systematic statistical survey of the forest fund, including for international reporting purposes (FAO FRA, FOREST EUROPE, LULUCF) and state planning.
INSPIRE (Infrastructure for Spatial Information in the European Community)	EU Directive 2007/2/EC on geospatial data - metadata and geoservices standards for interoperability. Implemented in Ukraine through Law No. 554-IX (NIGD).
GIS (Geographic Information System)	A geographic information system is a software and hardware complex for collecting, storing, analysing and displaying spatial data on forests.
LiDAR (Light Detection and Ranging)	A method of remote sensing with laser scanning for three-dimensional mapping of the forest canopy and timber stock assessment.
WMS / WFS / API	OGC (Open Geospatial Consortium) standards: WMS - Web Map Service (raster maps), WFS - Web Feature Service (vector data), API - Application Programming Interface.
QA/QC (Quality Assurance / Quality Control)	QA/QC is a system of procedures for verification of field and desk-based forest management data.

Term / Abbreviation	Decoding and explanation
IPCC / IPCC (Intergovernmental Panel on Climate Change)	Intergovernmental Panel on Climate Change - develops methodological guidelines for greenhouse gas accounting in the LULUCF sector.
REDD+ (Reducing Emissions from Deforestation and Forest Degradation)	The UNFCCC mechanism for climate finance for forest conservation in developing countries.
GCF (Green Climate Fund)	The UNFCCC Multilateral Climate Fund is the main source of climate finance for forest countries.
GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit)	The German Agency for International Cooperation is a key partner of the FSC reform in Ukraine.
Sentinel-1/2	Sentinel satellites of the Copernicus programme (ESA/EU): Sentinel-1 - SAR radar, Sentinel-2 - optics. Free data for forest cover monitoring.
GNSS (Global Navigation Satellite System)	Global Navigation Satellite System (GPS, GLONASS, Galileo) - for geodetic reference of field measurements.
Forest management - FMP (Forest Management Planning)	Forest Management Planning is a systematic process of assessing and planning the management of a forest fund.
EFI (European Forest Institute)	The European Forest Institute is an international research organisation that administers the European Forest Information System (EFIS).
NGDI	National Geospatial Data Infrastructure - according to the Law No. 554-IX; a system for integrating state geospatial resources, including the State Forestry Cadastre.