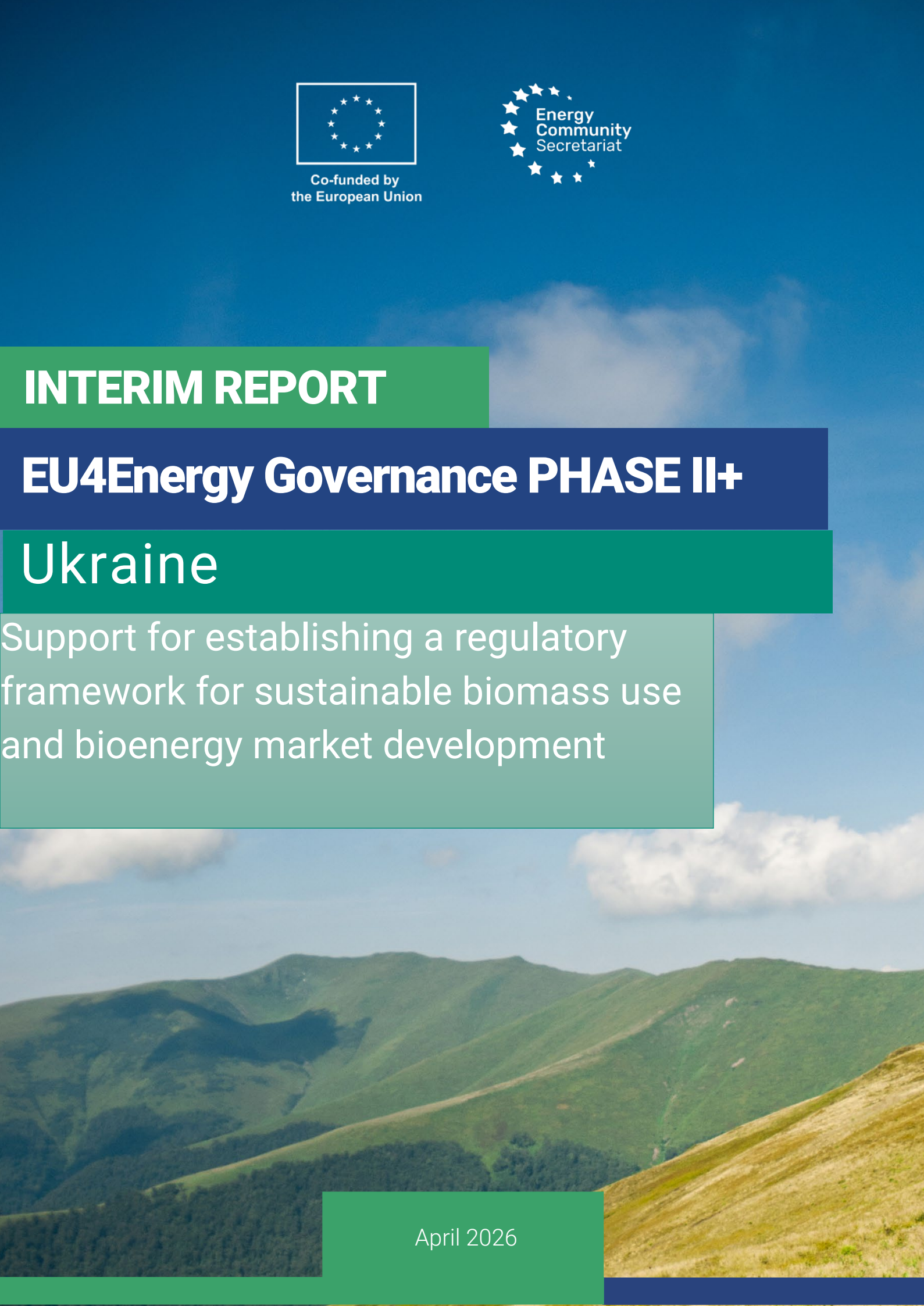

INTERIM REPORT

EU4Energy Governance PHASE II+

Ukraine

Support for establishing a regulatory framework for sustainable biomass use and bioenergy market development

April 2026

Co-funded by the European Union

Energy Community Secretariat

Impressum

Title: *Support for establishing a regulatory framework for sustainable biomass use and bioenergy market development, including consultations with market players in Georgia, Moldova and Ukraine*

Report for *Ukraine:*
Task 1: Concept for implementation, verification and monitoring of the obligation for fuel suppliers to place renewable fuels on the market in Ukraine
Task 2: Concept for implementation and verification of sustainability and GHG emissions saving criteria for biofuels, bioliquids and biomass fuels

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Abbreviations

Abbreviation	Meaning of the abbreviation
ACM	Dutch Authority for Consumers and Markets
BOS	Biofuel Obligation Scheme
CB	Certification Body
CP	Contracting Party of the Energy Community Treaty
DANAK	Danish Accreditation Fund (national accreditation body)
DEA	Danish Energy Agency
DfB	Database for Biofuels
DSO	Distribution System Operator
DUR	Dansih Utility Regulator
EC	European Comission
EnCS	Energy Community Secretariat
EO	Economic Operator
EU	European Union
GHG	Greenhouse Gases
GO	Guarantees of Origin
HBEs	Hernieuwbare Brandstof Eenheden (Renewable Fuel Units)
ILUC	Indirect Land-Use Change
MID	Measuring Instruments Directive
NAAU	National Accreditation Agency of Ukraine
NEA	Dutch Emissions Authority
NECP	National Energy and Climate Plan
NORA	National Oil Reserves Agency
NUTS	Nomenclature of Units for Territorial Statistics
PoS	Proof of Sustainability
RED II	Directive (EU) 2018/2001
RES -T	Renewable Energy Sources in Transport
REV	Renewable Energy Registry
RFNBO	Renewable Fuels of Non-Biological Origin
RTF Certificate	Renewable Transport Fuel Certificate
RTF Registry	Renewable Transport Fuel Registry
RTFO	Renewable Transport Fuel Obligation
RvA	Dutch Accreditation Council
SAEE	State Agency on Energy Efficiency and Energy Saving
TSO	Transmission System Operator
VS	Voluntary Scheme

Glossary

Advanced biofuels	Advanced biofuels are renewable transport fuels made exclusively from the feedstocks listed in Annex IX Part A of the A of the Directive (EU) 2018/2001 of 11 December 2018 on the promotion of the use of energy from renewable sources (RED II), as adapted and adopted by Decision 2021/14/MC-EnC and Decision 2022/02/MC-EnC.
Biofuels	Liquid fuel for transport produced from biomass.
Bioliquids	Liquid fuels for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass.
Biomass fuels	Gaseous and solid fuels produced from biomass.
Biomass	Biodegradable fraction of products, waste and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin.
Certification audit	Initial audit before participation in a scheme, with the purpose of issuing a certificate under a voluntary scheme.
Certification body	Independent accredited or recognised conformity assessment body that concludes an agreement with a recognised voluntary scheme to provide certification services for raw materials or fuels by carrying out audits of economic operators and issuing certificates on behalf of the voluntary schemes using the voluntary scheme's certification system. It must be accredited pursuant to the relevant delegated act, as adapted for the Energy Community.
Database for Biofuels	Central point for transmission and tracing of sustainability and greenhouse gas emissions saving characteristics of consignments of liquid or gaseous fuels through the whole supply chain from economic operator to economic operator, as well as data that is specific for the individual transaction.
Economic operator	Producer of raw material, a collector of waste and residues, an operator of installations processing raw material into final fuels or intermediate products, an operator of installations producing energy (electricity, heating or cooling) or any other operator, including of storage facilities or traders that are in physical possession of raw material or fuels, provided that they process information on the sustainability and greenhouse gas emissions saving characteristics of those raw materials or fuels.
Food and feed crops	Starch-rich crops, sugar crops or oil crops produced on agricultural land as a main crop excluding residues, waste or ligno-cellulosic material and intermediate crops, such as catch crops and cover crops, provided that the use of such intermediate crops does not trigger demand for additional land
Implementing and delegated acts	Secondary legislation adopted by the European Commission which either supplements or amends non-essential parts of EU legislation

	(delegated act) or sets uniform conditions for applying EU law (implementing act), as adapted and adopted by the Energy Community's Permanent High-Level Group.
Mass balance system	A chain-of-custody approach mandated under the RED (e.g. RED II / RED recast) whereby materials (raw materials, intermediate products, fuels) with different sustainability and greenhouse gas (GHG) emission characteristics may be physically mixed in the supply chain, but their sustainability attributes (e.g. "certified sustainable" or "non-certified") are tracked and allocated by bookkeeping, so that the volumes leaving the system do not exceed the volumes entering with the given sustainability attributes. Article 30 of REDII defines the characteristics of the mass-balance system while Article 19 of the Implementing Regulation 2022/996 prescribes the implementation rules.
Obligated fuel supplier	The entity designated by a Contracting Party as responsible for meeting the renewable energy obligation in the transport sector.
Proof of sustainability	Declaration by an economic operator, made on the basis of a certificate issued by a certification body within the framework of a voluntary scheme certifying the compliance of a specific quantity of feedstock or fuels with the sustainability and greenhouse gas emissions savings criteria set out in Articles 25(2) and 29 of Directive (EU) 2018/2001.
Recycled carbon fuels	Recycled carbon fuels are liquid and gaseous fuels produced from liquid or solid waste streams of non-renewable origin, or from waste processing gases and exhaust gases of non-renewable origin, that cannot be avoided, and that would otherwise be released into the environment.
Renewable Transport Fuel Certificate	A compliance unit used in many EU Member States (and the UK before Brexit) to show that an obligated fuel supplier has met its renewable energy obligation in transport under the Renewable Energy Directive (RED II/III).
Renewable Transport Fuels of Non- biological origin	Liquid and gaseous fuels used in transport and other energy sectors whose energy content comes from renewable sources other than biomass.
Renewable Transport Fuel Registry	Electronic registry that records renewable transport fuels (biofuels, advanced biofuels, RFNBOs, recycled carbon fuels, electricity) placed on the market and enables trading of certificated.
Surveillance audit	Follow up audit of certificates issued by a certification body within the framework of a voluntary scheme after certification and before a re-certification audit, which can be carried out quarterly, half annually or annually.
Supervision of certification bodies	Supervision of certification bodies by national authority to check the issued sustainability and GHG emission compliance certificates, data used, and procedures applied in independent verification process.
Supervision of economic operators	Surveillance monitoring by a) certification body under voluntary scheme to confirm if the economic operator complies with the rules of the scheme and reports correct information and procedures; b) by national authority pursuant to Article 17 of Implementing Regulation

	2022/996 or to the governance of the national DfB (if any).
Sustainability and GHG compliance certificate	Conformity statement by a certification body within the framework of a voluntary scheme, certifying that an economic operator complies with the requirements of RED II.
Sustainability and GHG emissions saving characteristics	Set of information describing a consignment of raw material or fuel that is required for demonstrating compliance of that consignment with the sustainability and greenhouse gas emissions saving criteria for biofuels, bioliquids and biomass fuels under RED II, Article 29.
Voluntary scheme	Organisation that certifies the compliance of economic operators with criteria and rules including, but not limited to, the sustainability and greenhouse gas saving criteria set out in Directive (EU) 2018/2001 and in Delegated Regulation (EU) 2019/807. A voluntary scheme is considered as recognised voluntary scheme if it is recognised by European Commission for the purpose of demonstrating compliance under RED II and thereafter recognised by the Secretariat in relation to the Energy Community.

1. INTRODUCTION AND PROJECT CONTEXT

1.1. Project background and rationale

Ukraine, as a Contracting Party to the Treaty establishing the Energy Community, from February 1, 2011[1] is legally bound to align its national energy frameworks with the European Union's renewable energy legislation. The Energy Community extends the EU's internal energy market to its eastern neighbouring countries, aiming to create an integrated, secure, and sustainable energy market. In this context, Ukraine has committed to transposing Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (RED II), adapted and adopted by Ministerial Council Decision 2021/14/MC-EnC and 2022/02/MC-EnC.

RED II requires Contracting Parties not only to set binding renewable energy targets across electricity, heating and cooling, and transport, but also to adopt sector-specific rules, sustainability criteria, and monitoring systems. For the transport sector in particular, the directive prescribes a minimum 14% share of energy from renewable sources by 2030, while setting detailed conditions on the contribution of the advanced biofuels, renewable hydrogen, and limitations on food and feed-based biofuels. These obligations are reinforced by sustainability and greenhouse gas (GHG) emissions savings criteria that ensure renewable fuels deliver real climate benefits. Only fuels meeting these criteria are eligible to count towards national targets. Furthermore, RED II establishes a strengthened system of guarantees of origin, mechanisms for statistical transfers and joint projects between countries, and transparent monitoring and reporting frameworks.

Recognising the importance of these reforms, the Energy Community Ministerial Council in 2021 adopted a decision requiring Contracting Parties to implement RED II provisions into national legislation by the end of 2022. This includes not only the adoption of binding national renewable energy targets and sectoral trajectories, but also the establishment of systems to monitor fuel supplier obligations, verify sustainability standards, and report progress to the Secretariat. However, as of early 2025, significant gaps remain in the Energy Community regarding the promotion of renewable energy in transport and the implementation of sustainability and GHG emissions saving criteria. Ukraine has taken steps to adopt primary legislation aligned with RED II, but secondary legislation and enforcement systems are still under development.
The rationale for this project is therefore twofold. First, it responds to a clear legal obligation: Ukraine, as a Contracting Party, must transpose and implement RED II to remain compliant with

[1] https://www.energy-community.org/dam/jcr:ad1209fa-027a-45ee-a903-83e1d7824aaa/EnC_Treaty.pdf

the acquis and avoid enforcement measures. Second, it addresses urgent policy and energy system needs. The transport sector in the county remains heavily dependent on imported fossil fuels, contributing to energy insecurity, exposure to volatile oil markets, and rising emissions. Establishing clear renewable energy targets and a sustainability framework will help diversify energy supply, improve resilience, and accelerate the transition to low-carbon transport.

1.2. Objectives of the assignment

The principal objective of this assignment is to translate the RED II requirements for renewable energy in the transport sector into practical, enforceable, and country-specific systems for Ukraine, ensuring full legal alignment with RED II and its implementing and delegated acts[2] while responding to the institutional and market realities of the country. This work aims to close the gap between regional Energy Community obligations and national practice by delivering ready-to-use designs, legal instruments where required, and the operational arrangements needed to monitor, verify, and enforce renewable transport fuel targets.

More specifically, the assignment will first establish a Renewable Transport Fuel Obligation model tailored to the country's market structure and administrative capacity.
The first objective is to define who is obliged to supply renewable transport fuels, how annual obligations and trajectories to 2030 should be set and applied (including appropriate use of multipliers and limits on food and feed-based biofuels), and which compliance instruments are both legally sound and practicable in the national context. The design model will also specify the reporting requirements, data flows, and traceability arrangements necessary for transparent monitoring.

The second objective, is to design a credible sustainability verification and GHG accounting framework so that only fuels meeting RED II sustainability and lifecycle emissions thresholds are eligible to count toward RES-T targets; this includes recommendations on recognition of voluntary certification schemes, national accreditation and audit roles, mass-balance and chain-of-custody rules, a REDII-compatible GHG calculation methodology, and the technical specification for a database to record certified consignments and guarantees of origin for gaseous renewable fuels.

The third objective is to convert the Renewable Transport Fuel Obligation (RTFO) and verification concepts into draft secondary legislation and complementary regulatory instruments that

[2] Delegated acts under RED II have not yet been incorporated into the Energy Community acquis, and their application within the Energy Community framework remains pending, subject to future adoption processes

integrate seamlessly with existing primary laws and sectoral regulations, thereby ensuring the legal texts are immediately adoptable and operable by designated authorities.

The fourth objective is to secure stakeholder understanding through targeted engagement and a workshop that will present the proposals, gather feedback, and provide practical guidance so that the main beneficiary and relevant stakeholders share a common implementation roadmap.

2. RED II REQUIREMENTS AND RELATED DELEGATED AND IMPLEMENTING ACTS

2.1. EnC Aquis related to renewable energy in transport

In 2021, the EnC Ministerial Council adapted and adopted five key legislative acts stemming from the EU's Clean Energy for All Europeans package (Decision 2021/14/MC-EnC).[3] The 2030 renewables, energy efficiency, and greenhouse gas reduction targets were adopted for the Energy Community a year later (Decision 2022/02/MC-EnC)[4].

Directive (EU) 2018/2001 of 11 December 2018 on the promotion of the use of energy from renewable sources (RED II), as adapted and adopted by Decision 2021/14/MC-EnC and Decision 2022/02/MC-EnC, has been integrated into the Energy Community acquis, in line with the Energy Community's efforts to align with the European Union's climate and energy policies.

According to RED II, Contracting Parties are required to achieve a minimum share of energy from renewable sources in the transport sector (RES-T) by 2030. This includes specific obligations regarding the contributions and limitations of various fuel types along the RES-T trajectory, ensuring the target is met. To promote the use of renewable energy in transport, RED II mandates that Contracting Parties impose obligations on fuel suppliers to integrate renewable fuels into the market. This measure aims to ensure that the targeted share of renewable energy consumption in transport is achieved by 2030. Furthermore, RED II stipulates that only biofuels, bioliquids, and biomass fuels that meet the sustainability criteria and greenhouse gas (GHG) emissions savings requirements outlined in the Directive can be counted towards the RES-T target.

In addition to RED II, the detailed implementation and technical elaboration of its provisions are enabled through delegated acts adopted under RED II by the European Commission. These delegated acts supplement RED II provisions on mainstreaming the use of energy from renewable sources in the transport sector and the sustainability criteria and GHG emissions saving criteria for biofuels, bioliquids and biomass fuels by i) defining the rules and procedures to ensure an efficient and harmonised approach to verifying sustainability compliance, ii) providing the detailed methodologies for assessing the compliance of specific fuels with the sustainability criteria and iii) defining the methodologies that can be used for determining the shares of biofuel and biogas for transport when produced from biomass that is processed with

[3] https://www.energy-community.org/dam/jcr:c755f9db-f6e7-448c-9cf5-0a5f02113ae2/19thMCDecision14_CEPII_30112021.pdf
[4] https://www.energy-community.org/dam/jcr:421f0dca-1b16-4bb5-af86-067bc35fe073/Decision_02-2022-MC_CEP_2030targets_15122022.pdf

fossil fuels in a common process and specifying the required content of information to be submitted by economic operators.

In line with Article 2 of Decision 2021/14/MC-EnC, the Contracting Parties were required to bring into force the law, regulations, and administrative provisions necessary to comply with RED II by 31 December 2022. Delegated acts under RED II have not yet been incorporated into the Energy Community acquis, and their application within the Energy Community framework remains pending, subject to future adoption processes.

2.2. Mainstream renewable energy in the transport sector

The key objectives and obligations of Contracting Parties (CP) concerning the implementation of the RED II in the transport sector are outlined in Articles 25 to 27 of RED II. These provisions set the foundation for the mainstreaming of renewable energy into transport systems and establish a comprehensive framework for ensuring sustainability, GHG emissions savings, and accountability in the use of renewable fuels. To mainstream the use of renewable energy into the transport sector accordingly to Article 25 of RED II each CP shall impose an obligation on fuel suppliers to ensure that the share of renewable energy in final energy consumption in the transport sector reaches at least 14% by 2030 (minimum share), in line with the indicative trajectory established by the CP and calculated according to the methodology set out in Article 25 and in Articles 26 and 27 of RED II. CP may exempt or differentiate between suppliers and fuels based on technology maturity and cost.

Renewable liquid and gaseous transport fuels of non-biological origin (RFNBOs) also must be included when they are used as intermediate products to produce conventional fuel, and recycled carbon fuels (RFCs) may also be considered.

Advanced biofuels and biofuels and biogas from specific feedstocks must reach minimum shares:

- of 0.2% in 2022,
- 1% in 2025,
- and 3.5% in 2030.

Caps for certain types of biofuels and biogas, notably those listed in Annex IX, Part B, are introduced, limited to 1.7% of the total energy content, unless otherwise justified and approved.

Fuel suppliers supplying fuel in the form of electricity or renewable liquid and gaseous transport fuels of non-biological origin may be exempt from the obligation to comply with the minimum

share of advanced biofuels and biogas produced from the feedstock listed in Part A of Annex IX of RED II.

From January 1, 2024, GHG emissions savings from the use of renewable liquid and gaseous transport fuels of non-biological origin must be at least 70%.

To limit the environmental and social risks associated with biofuels from food and feed crops, especially those linked to indirect land-use change (ILUC), Article 26 of RED II sets out the specific limitations on the use of biofuels, bioliquids, and biomass fuels produced from food and feed crops in the transport sector. Accordingly, the specific rules stipulate that, when calculating a Contracting Party's gross final consumption of energy from renewable sources and the minimum share under Article 25 of RED II, the share of such fuels must not exceed one percentage point above their 2022 share in road and rail transport, with an absolute cap of 7%. If the share in 2022 was below 1%, it may be increased to a maximum of 2%. CP may set lower limits based on ILUC concerns and may reduce its overall renewable energy target accordingly if such fuels are further restricted. In other words, if the limit for biofuels produced from food and feed crops is set to 0%, the target can be reduced by 7 percentage points. High ILUC-risk fuels must not exceed 2019 consumption levels unless certified as low ILUC-risk, with a gradual phase-out to 0% by 2030.

The share of renewable energy in the transport sector must be calculated using a harmonised methodology. Specific rules in Article 27 of RED II regarding the minimum shares of renewable energy in the transport sector require:

- *Defining eligible energy sources that may be counted* towards the renewable energy share, including renewable electricity, biofuels, biogas, renewable fuels of non-biological origin, and optionally, recycled carbon fuels,
- Setting the denominator as the total energy content of all fuels supplied for use in road and rail transport (including conventional and renewable fuels), and the numerator as the energy content of renewable sources only, with the optional inclusion of recycled carbon fuels,
- *Applying energy multipliers* to incentivise the use of advanced renewable fuels:
  - 2× for biofuels and biogas from Annex IX,
  - 4× for renewable electricity in road transport,
  - 1.5× for electricity in rail transport,
  - 1.2× for renewable fuels in aviation and maritime sectors (excluding food/feed-based fuels,

- *Ensuring accurate accounting* of renewable electricity, particularly electricity directly sourced from renewable installations or fully renewable grid electricity, under strict conditions to avoid double-counting.

Full implementation of RED II regarding mainstream renewable energy in the transport sector requires not only the transposition of Articles 25-27 but also the incorporation of detailed methodologies and definitions in the European Commission's delegated acts, adapted for the Energy Community, as outlined in Table 2-1.

2.3. Sustainability and GHG emissions saving requirements

To ensure that renewable energy sources contribute effectively to climate goals, any biofuels, bioliquids, and biomass fuels used to meet the national RES-T targets, or those receiving financial support through incentive schemes, must meet sustainability and greenhouse gas emissions reduction criteria outlined in RED II. This applies irrespective of the geographical origin of the biomass, i.e. independently of whether the raw materials and/or fuel are produced within the Energy Community or are imported. Article 30(3) of RED II imposes upon Contracting Parties the obligation to take measures to ensure that economic operators submit reliable information regarding the compliance with these requirements.

Biofuels, bioliquids and biomass fuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues, are required to fulfil only the greenhouse gas emissions saving criteria. This also applies to waste and residues that are first processed into a product before being further processed into biofuels, bioliquids and biomass fuels.

The greenhouse gas emissions savings from the use of biofuels, bioliquids and biomass fuels (compared to their fossil fuel comparators) must be:

- at least 50% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations in operation on or before 5 October 2015;
- at least 60% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 6 October 2015 until 31 December 2020;
- at least 65% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 1 January 2021.

The greenhouse gas emissions saving from the use of biofuel, bioliquids and biomass fuels should be calculated according to the principles set in Article 31 of RED II:

- by using default values provided in the Directive Annex V and Annex VI for fuels where the annualised emissions from carbon stock changes caused by land-use change are zero or less;
- by calculating actual emissions using the detailed methodology in the Directive Annex V and Annex VI;
- by combining default values for some stages of the supply chain with actual values for others (a hybrid method).

Instead of using default values a Contracting Party may submit to the Secretariat a report including information on the typical greenhouse gas emissions from the cultivation of agricultural raw materials of the areas on their territory classified as level 2 in the nomenclature of territorial units for statistics (NUTS). The reports should include description of the method and data sources used to calculate the level of emissions. That method shall consider soil characteristics, climate and expected raw material yields.

Economic operators may claim actual GHG values for biofuels only if their capacity to calculate such values has been verified by an accredited certification body through an audit, ensuring compliance with the methodology in Annex V and/or Annex VI of RED II.

The Implementing and Delegated acts adopted by the European Commission for the European Union listed in following table, are not automatically applicable in the Energy Community. The Implementing and Delegated acts are currently undergoing a process of adaptation, after which they will be adopted by the Permanent High-Level Group.

Table 1. Decisions, Implementing Regulations and Delegated Regulations supplementing RED II

Scope	Delegated Act
Verification of sustainability, monitoring and reporting	Implementing Regulation (EU) 2022/996 (rules and procedures for verification of compliance of sustainability and GHG saving criteria; obligations for VS, economic operators and MS) Commission Decision 2011/13/EU (information to be submitted by economic operators to MS)
Determining sustainability and GHG emissions of biomass sourcing	Delegated Regulation (EU) 2019/807 (certification of low ILUC-risk feedstock) Regulation EC 1307/2014 (criteria and geographic ranges of highly biodiverse grasslands) Commission Decision 2010/335/EU (guidelines for calculation of land carbon stocks) Delegated Directive EU 2024/1405 (amending Annex IX – Part A and B feedstock)
Demonstrating compliance with sustainability criteria for forest biomass	Implementing Regulation (EU) 2022/2448 (operational guidelines for economic operators, VS, MS)
RFNBOs and Co-processing of biofuels with fossil fuels	Delegated Regulation (EU) 2023/1184 (RFNBOs production) Delegated Regulation (EU) 2023/1185 (GHG thresholds for RFNBOs) Commission Delegated Regulation (EU) 2023/1640 (methodology for determining the share of biofuels and biogas for transport in co-processed fuels)

The compliance with the criteria regarding sustainability and GHG emissions saving of biofuels, bioliquids and biomass fuels can be proven either by recognised voluntary schemes (presented in detail in the following sections) or national certification schemes.

A Contracting Party may set up national schemes where compliance with the sustainability and greenhouse gas emissions saving criteria is verified throughout the entire chain of custody involving competent national authorities. The Contracting Party may notify such a national scheme to the Secretariat, which may then issue an opinion on whether such a notified national scheme complies with the conditions laid down in the Directive. A positive opinion ensures that other compliance schemes established in the Energy Community Contracting Parties shall not refuse mutual recognition with that Contracting Party's scheme. Since the national certification schemes require more administrative resources for the national authorities, in the European Union, many Member States rather opt for compliance being demonstrated through voluntary schemes recognised by the European Commission, rather than developing their own national schemes.

2.4. Voluntary schemes and certification under voluntary schemes

A Voluntary Scheme (VS) under RED II is a certification system recognized by the European Commission that enables economic operators (biofuel producers, traders, and importers) to prove compliance with RED II sustainability and GHG emissions saving criteria. Up to date, the Commission has formally approved 18 voluntary and national certification schemes[5], and these are considered as 'recognised voluntary schemes'.

An economic operator may freely decide which voluntary scheme to engage. The most widely used voluntary schemes for biofuels and bioliquids from agricultural feedstock and waste are briefly shown and described in the following table.

Table 2. Basic information on the most widely used voluntary schemes

International Sustainability and Carbon Certification (ISCC EU), https://www.iscc-system.org/	
Type of feedstock(s):	Agricultural biomass, forest biomass, wastes and residues.
Type of fuel(s):	All. The scheme covers biofuels, bioliquids and biomass fuels as well as renewable fuels of non-biological origin (RFNBOs) and recycled carbon fuels (RCFs).
Chain of custody coverage:	Full fuel chain (for biomethane from the production unit up to the point of consumption), including compliance of the consignments of biofuels, bioliquids and biomass fuels with the low indirect land-use change-risk criteria set in Delegated Regulation (EU) 2019/807.
Geographical coverage	Global
Roundtable on Sustainable Biomaterials (RSB), https://rsb.org/	
Type of feedstock(s):	Agricultural biomass, wastes and residues (forest biomass is excluded)
Type of fuel(s):	All
Chain of custody coverage	Full fuel chain (for biomethane up to the production unit), including compliance of the consignments of biofuels, bioliquids and biomass fuels with the low indirect land-use change-risk criteria set in Delegated Regulation (EU) 2019/807.
Geographical coverage	Global
Biomass Biofuels voluntary scheme (2BSvs), https://www.2bsvs.org/	
Type of feedstock(s):	Agricultural biomass (including wastes and residues)
Type of fuel(s):	All
Chain of custody coverage	Full fuel chain (for bio methane up to the production unit).
Geographical coverage	Global
Sustainable Resources (SURE), https://sure-system.org/en-us/	
Type of feedstock(s):	Agricultural and forest biomass (including wastes and residues)
Type of fuel(s):	Biomass fuels
Chain of custody coverage	Full fuel chain (for biomethane from the production unit up to point of consumption)
Geographical coverage	Global

[5] Voluntary schemes

Other voluntary schemes for biomass sustainability and GHG emissions saving compliance include KZR IiG system, REDcert, RTRS EU RED, SBP and Better Biomass, among others.

2.5. Verification of compliance through a recognised voluntary scheme

Voluntary schemes may only certify economic operators if they meet specific compliance requirements. These include having a documentation management system and an auditable system for securely storing and reviewing all evidence that supports their claims. Operators must retain the evidence that demonstrates compliance for a minimum of five years, or longer if required by the relevant national authority. Additionally, they must take full responsibility for preparing and providing any information needed for auditing of such evidence.

1.2.1. Certification body (independent auditor for compliance verification)

A certification body (CB) is an independent, accredited, or otherwise recognised conformity assessment body that has entered into an agreement with a voluntary scheme to provide certification services in the context of RED II. These services include auditing economic operators (e.g., producers, traders, importers) for compliance with sustainability and greenhouse gas (GHG) emissions saving criteria and issuing certificates in accordance with the scheme's rules.

In the European Union, CBs operating on behalf of the scheme must be accredited by a national accreditation body and in accordance with Regulation (EC) 765/2008[6], and accredited to ISO 17065[7], and 14065[8] for audits on actual GHG values. Article 11 of the transposition of Implementing Regulation 2022/996 into EnC acquis (draft version) envisages that certification bodies accredited in a Member States of the European Union shall be allowed to perform certification audits in Contracting Parties.

The Contracting Party establishes procedures allowing certification bodies to register for supervision by the State and for carrying out the supervision.
The list of certification bodies under a certain voluntary scheme is listed on the webpage of each scheme. The list also indicates for each certification body by which national public authority it was recognised, and which entity or national public body is monitoring it. Information about

[6] Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93
[7] ISO/IEC 17065:2012 – Conformity assessment – Requirements for bodies certifying products, processes and services
[8] ISO 14065:2020 -Greenhouse gases — Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.

recognised voluntary schemes and their coverage (majority with global coverage) is available on the European Commission's website[9].

Some well-known certification bodies operating under RED II recognised voluntary schemes include Bureau Veritas, AgroVet, DQS, DNV, SGS, RINA, TÜV NORD, among others.

Certification audit

Certification audit is an initial audit prior to an economic operator's participation in a voluntary scheme, with the purpose of issuing a certificate under a voluntary scheme. The voluntary scheme provides documentation and guidelines for the audit. Certification bodies conduct the audits in accordance with ISO 19011[10] or equivalent.

As part of the certification, the auditor (verifier) verifies compliance with Articles 29 and 30 of RED II, especially giving attention to how the economic operator addressed waste and residues, actual GHG emission calculations, mass balance system, natural and non-natural highly biodiverse grassland. These aspects are further detailed in Implementing Regulation 2022/996[11].

During the audit it is essential to verify that the harvesting of agricultural waste and residues does not have a negative impact on the soil quality and the soil carbon stock. Such verification shall ensure that a relevant set of essential soil management or monitoring practices is applied on the land to promote soil carbon sequestration and soil quality. Furthermore, highly biodiverse grassland that existed in or after January 2008 may be used for fuel production on the condition that harvesting of the raw material is necessary to preserve the status of the grassland as highly biodiverse grassland and that current management practices do not present a risk of causing biodiversity decline. In that case economic operators shall provide the evidence, or evidence that they have been granted permission by the relevant competent authority to harvest the raw material in order to preserve the highly biodiverse grassland status.

Low ILUC-risk certificates are additional to the sustainability and greenhouse gas emissions saving criteria in cases where this type of certificate is required.

Audits are typically conducted on-site at the economic operator's premises. Remote audits are permitted only under specific conditions and must be justified and documented. Voluntary schemes may allow for group audits under defined conditions. In such cases, a group manager must be appointed to represent the economic operators included in the group.

[9] https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/voluntary-schemes_en
[10] ISO 19011: Guidelines for Auditing Management Systems
[11] Commission Implementing Regulation (EU) 2022/996 of 14 June 2022 on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria

Sustainability certificate and Proof of Sustainability

The certification body, accredited under a voluntary scheme, issues a certificate verifying that the economic operator complies with RED II sustainability and GHG emissions saving criteria. This certificate confirms eligibility of EO to participate in the scheme and to issue Proofs of Sustainability (PoS) or a self-declaration for consignments. PoS serves as evidence of compliance at the point of placing the fuel on the market. It is essential for receiving incentives or contributing to renewable energy targets.

The sustainability certificate is published on the scheme's web page and is publicly available. It is valid in all EU Member States and should be valid in all Energy Community Contracting Parties once the system is in place. Certificates are generally valid for one year, after which a re-certification audit is required to renew the certificate, in accordance with the voluntary scheme's rules and RED II requirements.

After certification, the certification body also carries out mandatory surveillance audits which can be carried out quarterly, half-annually or annually. If a certification body identifies non-conformities, the certificate can be suspended (temporarily invalid) or withdrawn permanently.

Database for Biofuels (DfB)

The RED II framework requires the operation of a central database to enable the tracing of renewable liquid and gaseous transport fuels that are eligible for being counted towards targets. A Contracting Party may set up a national database that is linked to the central database of the Energy Community (not established yet) ensuring that information entered is instantly transferred between the databases. If set up, the national Database for Biofuels (DfB) shall include information about biofuels and biogas consumed in the transport sector that are produced, imported and placed on the market under the renewable transport fuel obligation in line with RED II.

Data to be transmitted through the whole supply chain are listed below, in line with Annex I of the Implementing Regulation 2022/996. This information should be in the database and is also a part of the Proof of Sustainability accompanying every fuel consignment of liquid and gaseous transport fuels.

(a) name of the voluntary or national scheme;

(b) proof of sustainability number;

(c) sustainability and GHG emission savings characteristics, including:

(i) statement on whether the raw material or fuel complies with the sustainability criteria

(ii) GHG emission data calculated according to the methodology set out in Annexes V and VI to Directive (EU) 2018/2001 or Delegated Regulation (EU) 2019/807;

(iii) description of when the installation started operation (for fuels only);

(d) name of raw material or name of raw material that the fuel is produced from;

(e) waste or animal by-product permit number (if applicable);

(f) fuel type (for fuels only);

(g) country of origin of raw material;

(h) country of fuel production;

(i) statement on whether the raw material or fuel complies with the criteria set out for low indirect land-use change-risk biofuels;

(j) information on whether support has been provided for the production of that consignment, and if so, the type of support scheme.

Data transmitted by trading, are in line with Annex I of the Implementing Regulation 2022/996 and should include:

(a) supplier company name and address;

(b) buyer company name and address;

(c) date of (physical) loading;

(d) place of (physical) loading or logistical facility or distribution infrastructure entry point;

(e) place of (physical) delivery or logistical facility or distribution infrastructure exit point;

(f) volume: For fuels, the energy quantity of the fuel must also be included. For the calculation of the energy quantity, conversion factors in Annex III to Directive (EU) 2018/2001 must be used.

Supervision by Contracting Parties

Under the RED II framework, each Contracting Party must appoint a competent authority to supervise the operation of:

a) certification bodies that are conducting independent auditing under a recognised voluntary scheme,
b) economic operators.

The competent authority in charge for supervision can appoint a supervision team considering the competence needed to achieve objective of the supervision or it can outsource this activity if it considers that it does not have internal capacities and competences.

Upon request, the certification body provides competent authorities with all necessary documentation to facilitate supervision, including audit schedules, reports, and locations.

Upon request, voluntary schemes provide access to actual GHG calculations certified under their voluntary scheme together with the respective audit reports to the national authorities responsible for supervision of the certification bodies.

Where a Contracting Party identifies serious or substantiated non-compliance by a certification body, it shall inform the Energy Community Secretariat and, where appropriate, the voluntary scheme concerned.

If a Certification Body is accredited by national authority of a Contracting Party and operates only in this Contracting Party, the supervision of the Certification Body is performed exclusively by the Contracting Party's competent authority. If the Certification Body operates in more than one Contracting Parties, those states must create a common supervision framework, designating one as the lead audit supervisor responsible for consolidating and sharing outcomes. The Contracting Party shall establish procedures allowing certification bodies, regardless of whether their head office is located in a Member State, Contracting Party or in a third country, to register for supervision and for carrying out the supervision.

Supervision of economic operator is performed by national authority in the country where the economic operator is operating. This means that all economic operators in the DfB are subjected to supervision by national authority. Upon request, economic operator provides all relevant information and evidence used to issue PoS for consignments and allows access for supervision

authority. The supervision is conducted on site. The supervision inspects and checks data and documents entered by Certification Body and economic operator into DfB.

2.5.1. Obligation of the economic operators within the biofuels supply chain

The obligations of economic operators (EO) that want to, or have to, participate in the sustainability and GHG emissions savings certification slightly differ in respect to their specific role in the supply chain (producer of biofuel vs. obligated fuel supplier). For example, the producer certifies the product (biofuel) and sells it to the fuel supplier that has legal obligation to place the sustainable biofuel on the market.

The general obligations of the economic operator are the following:

- Arranges for an adequate standard of independent auditing (under an Energy Community recognised voluntary scheme or national scheme, if any) for sustainability criteria and GHG emissions.
- Before becoming a part of the scheme, the EO undergoes initial audit (certification audit). It submits to the auditor reliable, thoroughly documented information regarding the compliance with the sustainability and greenhouse gas emissions saving criteria within the chain. The documentation is determined by the type of the operator (e.g. producer or fuel supplier) and by characteristics of the feedstock (e.g. waste or agricultural biomass).

  Some of the requirements include:

- demonstration of fulfilment of sustainability and greenhouse gas emissions saving criteria,
- demonstration of usage of mass balance system to assure that each consignment is counted only once in a point,
- provision of information on support provided to produce that consignment,
- low ILUC-risk certification, where applicable, which is additional to sustainability and GHG criteria and
- verification of waste and residues, including traceability and classification.

  The independent auditing by a recognised scheme shall verify that the systems used

by economic operator is accurate, reliable and protected against fraud, including verification ensuring that materials are not intentionally modified or discarded so that the consignment or part thereof could become a waste or residue.

- Upon positive initial audit and acquiring a certificate, EO reports certificate information into national Database for Biofuels (DfB). The certificate is valid for one year.
- EO issues a Proofs of Sustainability (PoS) for all consignments of biofuel placed on the market and enters the data in the DfB. Any transactions between different EO's within the supply chain are documented within the national database (registering entry and exit point). Documentation (PoS) is transmitted together with physical shipments of raw material or fuels through the supply chain.
- All economic operators must use a mass balance system to track sustainability characteristics and GHG emissions along the supply chain.
- EO allows surveillance auditing by certification body and compliance check (surveillance) by national authority and provides all relevant documentation upon request. Records must be retained for a minimum of 5 years, and upon request, made available to the relevant national authorities.
- Fuel supplier makes information on geographic origin, feedstock type, amounts of biofuels and bioliquids placed on the market publicly available on the website and updated annually.
- Fuel supplier reports to the national authority on obligation achievement (according to defined schedule).

2.5.2. Obligation of the EnC Contracting Party

The obligations of the EnC CP are the following:

- Defines sustainability and GHG savings criteria requirements according to RED II in the national legislation. Guides the economic operators in submitting accurate and verified data regarding compliance with sustainability and greenhouse gas emissions savings criteria, as required by Articles 29 and 30 of the Directive (with clear legislation and guidelines).

- Sets a legal framework for accreditation of certification bodies by CP's accreditation body or an accreditation body of Member State of the European Union.
- Monitors the operation of certification system and performs supervision, including inspections of certification body or an economic operator, to supervise compliance. It establishes procedures allowing certification bodies, regardless of whether their head office is located in, to register for supervision and for carrying out the supervision.
- Implements mechanisms to detect, report, and take corrective action in case of fraud, irregularities, or non-compliance by economic operators or voluntary schemes in line with the provisions of the Regulation 2022/996 as adapted and adopted by the EnC PHLG.
- Establishes and enforces effective, proportionate, and dissuasive penalties for breaches of obligations under the RED II.
- May establish, and if so, oversees a national Database for Biofuels compatible with the centralised database for Energy Community to ensure traceability and oversight of biofuels, bioliquids, and biomass fuels, including all sustainability and transaction data. It monitors the transactions within the national database.
- Defines reporting procedure and submission deadlines for all actors in the supply chain. Proscribes obligations, procedures and deadlines and modes of submission.
- May publish annually publicly accessible information on the geographic origin, feedstock type, and sustainability characteristics of biofuels, bioliquids, and biomass fuels per fuel supplier
- Reports to the Energy Community Secretariat annually, in aggregated form, information on renewable energy targets, biofuels placed on the market, their sustainability characteristics, and associated GHG emissions savings.

3. BENCHMARKING BEST PRACTICES

In the European Union, all Member States had to comply with the obligations in Articles 25–31of RED II (as it was then applicable in the European Union[12]) on renewable transport fuels, notably a 14% renewables-in-transport target by 2030 (with national baselines), mandatory GHG savings, and strict sustainability criteria (biodiversity safeguards, GHG thresholds, certification). However, each country's obligation scheme reflects its market and institutional context. For example, Ireland administers a simple tradable-certificate RTFO noted for "market-driven compliance flexibility and real-time monitoring", whereas the Netherlands uses a segmented certificate scheme (*Hernieuwbare Brandstof Eenheden*, HBEs) with detailed auditing rules.

The following case studies summarize how Ireland and the Netherlands implement RED II Articles 25–31: including RES-T targets and the respective calculation rules, specific rules for biofuels, bioliquids and biomass fuels (Articles 25–27), sustainability and GHG emissions saving criteria and their verification (Articles 29–31). Furthermore, certification, designated institutions, compliance mechanisms, and integration of electricity and advanced fuels on the market, highlighting lessons for Ukraine (e.g. ensuring flexibility, enforceability, data integrity, and administrative feasibility).

In addition, the key elements of Denmark's biomethane injection system are also presented as an example of best practice (legal and institutional framework, support schemes and certification, certificates and payments, system operation, sustainability and quality assurance, and monitoring, enforcement and penalties).

3.1. Ireland's Renewable Transport Fuel Obligation

- **Background and Targets:** Ireland's RTFO evolved from the 2010 Biofuel Obligation Scheme, which mandated rising biofuel blends (from 4% in 2010 to ~21% by 2024). Under RED II, Ireland must ensure a 14% renewable transport share by 2030. In practice, Ireland set more ambitious interim goals: for example, the 2025 RTFO was raised to 21% (energy basis) and 25% for 2025. An advanced biofuels sub-target (Annex IX of REDII) is phased in: 0% before 2023, 0.1% in 2024 and 1.5% in 2025 (rising thereafter). These targets align with Ireland's climate plans (e.g. E10 and B20 blending mandates

[12] In the European Union, RED II was amended by Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023, hence the usual reference to the so-called RED III

by 2030) and provide a clear multi-year trajectory for obligated fuel suppliers.

- Obligated fuel suppliers are primarily fuel suppliers, specifically, companies (and large oil consumers) who supply mineral oil (petrol, diesel) for transport and who are liable to pay the NORA (National Oil Reserves Agency, a State agency under the Department of Transport) levy. By statute, NORA automatically opens an RTFO account for any entity already subject to the NORA oil stocks levy. Other businesses (e.g. independent biofuel suppliers) not subject to the levy may apply to NORA to hold a voluntary RTFO account. In practical terms, almost all importers or refiners of transport fuel are covered. Equally, any renewable fuel injected into road transport networks, such as biomethane for CNG vehicles or green electricity at public EV chargers, can generate certificates creditable against the RTFO. In summary, any company owning transport fuel at the tax/duty point in Ireland is an obligated party and must either supply sufficient renewable fuel (or purchase certificates) to meet the RTFO, or pay the statutory buy out fee.
- Sustainability and GHG Emissions Saving Criteria: All renewable fuels must meet EU sustainability and GHG emissions saving rules. Producers obtain certification via approved voluntary schemes (e.g. ISCC, REDcert) to prove compliance. The RTFO requires minimum lifecycle GHG emissions saving (typically ≥50–60% compared to fossil fuel comparators, depending on technology). High ILUC-risk biofuels (e.g. palm and soybean) are effectively banned: Ireland has capped food-crop biofuels at ~2.3–2.4% of transport energy and plans to eliminate palm oil by 2030. Biomethane (renewable gas) is integrated: Gas Networks Ireland issues Guarantees of Origin, and once biomethane is injected into the transport network NORA (National Oil Reserves Agency, a State agency under the Department of Transport) issues RTFO certificates.
- Certification and Verification: Obligated suppliers apply for RTFO certificates (RTFCs) via NORA's online registry. Each RTFC (1 MJ of qualifying fuel) is only issued after independent verification of sustainability and GHG emissions saving criteria. RTFCs are color-coded by feedstock (green for Annex IX A, red for food and feed crops, orange for all other compliant biofuels). NORA's digital system enforces the rules: it validates

sustainability certificates, tracks certificate balances, and flags any shortfalls. Suspicious or non-compliant claims trigger audits; fraudulent RTFCs can be revoked, and offenders can face penalties.

- Institutional Roles: The scheme is administered by NORA. NORA maintains the registry, issues RTFCs, and enforces compliance. The Minister for Transport (via statutory instruments) sets the annual RTFO rate, sub-target and buy-out charge. Technical support comes from other bodies: e.g. the EPA (Environmental Protection Agency) and NSAI (National Standards Authority of Ireland) advise on novel biofuel pathways, and the Sustainable Energy Authority of Ireland (SEAI) models energy data and tracks RTFO progress. The Department of Climate, Energy and the Environment coordinates EU transposition and cross-sectoral policy. This clear division between one agency (NORA) running the market registry and enforcement, and government setting targets, has kept administration lean.
- Monitoring, Compliance and Penalties: NORA's online platform requires obligated suppliers to report fuel volumes and certification claims quarterly, with an annual reconciliation by March. After each quarter NORA validates claims and issues RTFCs; a "Final Statement of Account" is issued early in the following year. By April 30, suppliers must surrender RTFCs equal to their obligation. Shortfalls are covered by the statutory buy-out fee: currently €0.05/MJ for general shortfalls and €0.08/MJ for advanced biofuels shortfalls. This fixed fee caps the cost of non-compliance and provides a predictable alternative to having to purchase certificates. NORA also has audit powers: it can rescind RTFCs and refer serious breaches to enforcement authorities. In practice, the buy-out payment is the main penalty (fraudulent schemes are subject to additional sanctions). Overall, routine data collection plus financial penalties and audits have ensured that almost all obliged fuel suppliers the RTFO.
- Renewable Electricity and RFNBOs: Ireland is extending its RTFO to e-mobility and RFNBOs. The 2025–27 policy introduces credits for renewable electricity at EV charging stations: one "electricity RTFC" is granted per unit of green energy supplied. This reward (effectively treating green charging as fuel displacement) incentivizes

investment in low-carbon transport power. Similarly, future sub-targets and respective credits are planned for Renewable Fuels of Non-Biological Origin (RFNBOs, e.g. green hydrogen or synthetic fuels). Biomethane from the grid already earns RTFCs as noted above. These additions broaden the RTFO beyond liquid biofuels, aligning it with EU's policy objectives on electrification and hydrogen use in transport.

- Lessons Learned for Establishing RTFO Frameworks in New Markets: Ireland's model illustrates that a straightforward, market-based RTFO can work well in a small market. Using tradable RTFCs provides compliance flexibility, while a fixed buy-out fee (limiting non-compliance cost) ensures enforceability. A strong IT registry (NORA's platform) maintains data integrity and automates enforcement rules. Crucially, administration is lean and self-funded: NORA runs the scheme with minimal levies (e.g. a €0.001/L biofuel levy to obligated suppliers covers the costs) and charges no transaction fees. Key takeaways for new RTFOs are therefore: set clear, phased targets; define obligated parties [e.g. primarily fuel suppliers, specifically, companies (and large oil consumers) who supply mineral oil (petrol, diesel) for transport] and consider thresholds to exempt very small suppliers; require certified sustainability via recognized schemes; and implement a centralized registry to track fuel deliveries and certificate balances. A combination of routine reporting (for data integrity) and a binding financial penalty (buy-out or fine) can enforce compliance without heavy bureaucracy. The Irish experience confirms that leveraging existing institutions (like NORA) and minimizing fees keeps the scheme administratively feasible and transparent.

3.2. The Netherlands' "Energy for Transport" System

- **Background and Targets:** The Netherlands introduced a mandatory renewable-fuel obligation in 2015 to meet earlier EU biofuels targets. RED II (14% by 2030) was transposed in 2022 (through Environmental Management Act). The current scheme uses tradable units called *Hernieuwbare Brandstof Eenheden* (HBEs). It imposes an ambitious trajectory: renewable content in road fuels rises from 17.9% in 2022 to ~28% by 2030. A minimum advanced biofuel sub-target climbs from 2.4% in 2023 to 7.0% by 2030. Large caps are imposed: conventional crop biofuels are limited to 1.4% of energy, and at least ~75% of renewable inputs must come from feedstocks listed in Annex IX of REDII). In effect, virtually all compliance is planned from biofuels produced from feedstocks listed in Annex IX A and B of REDII, with minimal share of biofuels produced from conventional crops.
- **Sustainability and GHG Emissions Saving Criteria:** Dutch law adopts EU sustainability rules in full. All biofuels, biogas, electricity or hydrogen used for transport must be certified (via voluntary schemes) to prove ≥50% GHG emissions savings compared to fossil fuel comparators (rising to 70% for new plants that started production after 2017). Biofuels from high ILUC-risk feedstocks (palm, soybean) are explicitly banned. No uncertified biofuel can generate HBEs. NEa (Dutch Emissions Authority) assigns each registered HBE a fixed CO_2-reduction value (the "HBE-reductiebijdrage") so that cumulative HBEs also realize the 6% fuel-cycle CO_2 cut. Renewable electricity to EVs and green hydrogen each earn HBEs multiplied by efficiency factors (4× for electricity, 2.5× for H_2), reflecting their higher effective savings. This structure ensures sustainability is enforced at the fuel-source level, with GHG savings outcomes built into the certificate accounting.
- **Certification and Verification:** The Dutch system requires strict auditing of all renewable inputs. Participating fuel and/or electricity suppliers must obtain verification from accredited auditors: each entry into the Renewable Energy Transport Register (REV) must be backed by a Verification Certificate from an RvA (Dutch Accreditation Council) accredited verifier. The REV is a database that records fuel volumes and HBE balances.

NEa reviews the data and conducts inspections: it cross-checks reported deliveries against Customs/excise data. Any failure of certification or data inconsistency means no HBEs are granted. In practice, this two-tier check (company-supplied verifiers plus NEa audits) ensures high data integrity.

- Obligated fuel suppliers are all companies that supply transport fuels in the Dutch market. In practice, this means licensed excise warehouses and excise-registered consignees for petrol, diesel and heavy oil, as well as importers of those fuels, when those fuels are delivered for transport use. Key obligated fuels include petrol (benzine), diesel (gasoil), liquefied petroleum gas (LPG) and fuels supplied to road, inland-waterway and certain agricultural vehicles. Heavy fuel oil (HFO) counts only if sold to domestic vessels (marine shipping within the Netherlands). Companies with annual deliveries below 500,000 L (diesel-equivalent) are exempt from the HBE requirement.
- Institutional Roles: Policy and legislation are set by the Ministry of Infrastructure and Water Management (IenW), supported by the Netherlands Enterprise Agency (RVO) for guidance. The Netherlands Emissions Authority (NEa) implements the scheme: it operates the REV, accredits auditors, issues guidance, and enforces compliance. NEa has legal authority to audit reports and levy fines. Supporting bodies include the Accreditation Council (RvA), which certifies private auditors, and the Customs and Excise Service, which supplies fuel sales data for verification. This clear institutional framework, i.e. IenW/RVO for policy, NEa for execution, plus statutory auditors, provides a robust governance model.
- Monitoring, Compliance and Penalties: Compliance is governed by NEa using the REV. Obligated companies register all fuel deliveries and HBE creation in the REV. Each year, NEa calculates the required HBE quota (in GJ) from reported fuel data. Companies must hold or purchase the required HBEs by April 30 each year; NEa then closes accounts. NEa enforces compliance through data audits and site inspections and retains strong sanction powers. Any shortfall can be officially determined and fines imposed under the Environment Act. The penalty system is graduated: minor errors incur warnings, while serious breaches trigger substantial fines. NEa can even correct

inaccurate records up to five years later, enforcing data accuracy.

- Renewable Electricity and RFNBOs: The Dutch obligation fully integrates e-mobility and RFNBOs. Renewable electricity supplied to EVs (metred on dedicated or sub-metred connections) generates "HBE-Other" certificates with a multiplier. Liquid or gaseous renewable fuels also qualify under HBE-Other with a multiplier. In effect, EV charging and hydrogen refuelling count toward the transport target. Biomethane and renewable hydrogen from approved suppliers similarly earn HBEs (as HBE-Other) under these rules.
- Lessons for Establishing RTFO Frameworks in New Markets: The Dutch experience underscores the value of a comprehensive registry and audit framework. Segmented certificates (HBEs) ensure fuels from feedstocks listed in Annex IX of REDII carry higher weight (enforcing sub-targets), and mandatory third-party auditing for every delivery builds trust in the data. Crucially, strict verification ensures enforceability: NEa's authority to audit records for years after creates a strong deterrent. That said, the Dutch scheme's general budget funding (no per-unit fees) and stable low-cost registry show that a well-designed market mechanism can operate efficiently without heavy charges to industry. In sum, key takeaways for new RTFOs are: establish a secure, user-friendly IT registry, require independent certification of every renewable input, define clear penalties for shortfalls, and ensure obligations phase up predictably. Including electricity and RFNBO fuels with fixed multipliers (as NL does) can broaden impact. By combining flexible certificate trading with rigorous data controls and low administrative overhead, policymakers can craft an enforceable and transparent RTFO.

3.3. Denmark's biomethane injection system

- **Role of biomethane in transport:** Denmark is among Europe's leading producers of biomethane, with approximately 40% of natural gas consumption covered by biomethane in 2023. While most biomethane is used across heating, industry, and power generation, Denmark has also enabled its use in the transport sector, particularly for compressed natural gas (CNG) vehicles and, increasingly, for renewable fuel claims by transport fuel suppliers through certificate-based mechanisms. This makes Denmark a relevant best-practice example for integrating grid-injected biomethane into transport decarbonisation policies.
- **Legal and institutional framework (overview):** Denmark has established a comprehensive legal framework for biomethane injection and certification, primarily under the Gas Supply Act and the Promotion of Renewable Energy Act. These laws transpose EU RED II/III sustainability and GHG emissions saving criteria for biomass fuels and define the roles of competent authorities. The Danish Energy Agency (DEA) oversees regulation, sustainability compliance, and support schemes, while Energinet, the national transmission system operator for electricity and gas, operates the gas grid and the Guarantees of Origin (GO) registry for renewable gases.
- **Biomethane registry and Guarantees of Origin:** All grid-injected biomethane is metered, quality-controlled, and registered by Energinet. For each verified megawatt-hour of injected biomethane, Energinet issues a Guarantee of Origin (GO) certifying the gas's renewable attribute. GOs include key information such as production facility, feedstock category, production period, GHG emissions performance, and whether the production has received public support. GOs are tradable and may be transferred independently of the physical gas, enabling market-based allocation of the renewable attribute. To avoid double counting, Danish state-aid rules require transparency on subsidy status: where biomethane production receives operational support, this is explicitly flagged in the GO. Producers may opt to renounce support in order to commercialise unsubsidised GOs for compliance or voluntary markets.

- Use of biomethane in transport and interface with fuel supplier obligations: Denmark does not impose a blending mandate or quota obligation on gas suppliers. Instead, biomethane contributes to transport decarbonisation through a certificate-based approach. Transport fuel suppliers subject to CO_2 reduction or renewable energy obligations may use cancelled biomethane GOs as documentary evidence of renewable gas use in transport, on a mass-balance basis, provided sustainability and GHG emissions saving criteria under RED II/III are met.

  Importantly, the GO registry operated by Energinet is not directly integrated with any renewable transport fuel obligation registry. Compliance with fuel supplier obligations is handled through separate reporting to the Danish Energy Agency, with GO cancellations serving as supporting evidence rather than automatic compliance instruments. This separation of functions, attribute tracking via GOs and obligation compliance via administrative reporting, provides flexibility while maintaining regulatory control.

  Direct physical use of biomethane also occurs in the transport sector, notably in CNG vehicles supplied via the gas grid. In such cases, the renewable nature of the fuel is typically claimed through the cancellation of corresponding GOs rather than physical segregation of gas molecules.

- Institutional Roles:

– Danish Energy Agency (DEA), under the Ministry of Climate, Energy and Utilities, oversees the framework. DEA issues permits, sets detailed regulations, conducts tenders, and audits compliance. DEA also administers the subsidy registry and can impose penalties (fines and subsidy clawbacks) for breaches of scheme rules or sustainability requirements.

– Danish Utility Regulator (DUR) (Forsyningstilsynet)[13] was established in 2018 by the Law on the Danish Utility Regulator to secure consumer interests in the utility sectors (electricity, natural gas, and district heating). In the gas sector, DUR enforces the Gas Supply Act, ensuring non-discriminatory access and adherence to technical standards.

[13] https://forsyningstilsynet.dk/about-us

- State-owned TSO (Energinet)[14] handles network operations and the GO registry. It processes grid connection requests, performs feasibility studies, and negotiates technical injection agreements under the "right-to-inject" principle. Energinet also monitors gas quality at entry points and issues renewable GOs for injected biomethane volumes. Local DSOs manage smaller connections.
- National accreditation body (DANAK)[15] accredits third-party verifiers who audit plant compliance.
- Plant operators and their investors carry out the development, construction, and operation of the plant. Farmers and waste processors supply biomass; they are contractually tied to meet the criteria confirmed in verification.

- **Best-practice lessons for scheme design:** Denmark's biomethane framework illustrates several transferable best practices for transport fuel policy design:

- Grid injection combined with GO-based tracking allows biomethane to serve multiple end uses, including transport, without physical segregation.
- Clear separation between registries (GO registry vs. fuel obligation reporting) avoids system complexity while preventing double counting.
- Transparency on subsidy status ensures compatibility with state-aid rules and preserves market integrity.
- Technology-neutral integration enables biomethane to compete alongside electricity and other renewable fuels in transport decarbonisation strategies.

  For countries designing new renewable transport fuel frameworks, Denmark demonstrates how biomethane can be integrated through certification and reporting mechanisms rather than mandatory blending, while still ensuring robust sustainability compliance and traceability.

[14] https://en.energinet.dk/about-us/
[15] https://danak.org/

4. COUNTRY CONTEXT ANALYSIS

4.1. National fuel supply chain

The oil and petroleum products market in Ukraine is mostly dependent on imports. The production of oil and petroleum products in 2020 (the last available energy balance of Ukraine from Eurostat) amounted to 2,476 ktoe and refers mostly to the production of crude oil, natural gas liquids, and a small share of additives. The total annual consumption of oil and petroleum products in 2020 amounted to around 14,174 ktoe, of which 48% was consumed in the transport sector.

In 2020, oil and petroleum products were imported from Russia (33.2%), Belarus (32.6%), Azerbaijan (7.8%), Lithuania (7.7%), Turkey (3.5%), Kazakhstan (3.3%), Greece (2.8%), United States (2.5%), Poland (1.7%), and smaller shares from other countries.

Consumption of petroleum products in road, rail, air and water transport in Ukraine amounted to 6,808 ktoe in 2020, with diesel fuel accounting for the largest share (52.8%). Motor gasoline accounts for 26.1% of total transport consumption, LPG 19.8%, while other oil products account for only 1.3%.

Table 3. Balance of LPG, Motor gasoline, Diesel oil, and Other oil products in Ukraine in 2020

Ktoe	LPG	Motor gasoline	Gas/Diesel oil	Other oil products
Import	1,716.2	1,056.2	6,137.2	248.2
Export	3.1	0.1	0.0	198.1
Total consumption	1,738.3	1,082.3	6,149.3	54.4
Transport sector consumption	1,344.8	1,776.6	3,598.0	88.9

Source: Eurostat Energy balance sheets, April 2023 Edition

In terms of transport modes, the highest consumption of petroleum products was achieved in road transport (98.4%), while the remaining quantities were consumed in air transport (1.3%) and rail transport (0.3%).

Table 4. Consumption of petroleum products in the transport sector according to the modes of transport

ktoe	LPG	Motor gasoline	Gas/diesel oil	Other oil products
Rail transport	0.0	0.0	21.3	0.0
Road transport	1,344.8	1,776.6	3,575.1	0.0
Air transport	0.0	0.0	0.0	88.9
Domestic navigation	0.0	0.0	1.6	0.0
Total	1,344.8	1,776.6	3,598.0	88.9

Source: Eurostat Energy balance sheets, April 2023 Edition

Since the invasion in February 2022, Ukraine has accelerated integration of its energy trade and infrastructure with Europe, moving away from its historical trade with Russia.

According to available data, the main suppliers of petroleum products (excluding crude) in 2024 were Greece (19.3%), Poland (13.1%), Lithuania (10.0%), and Turkey (8.8%). India's share declined sharply from 13.0% in 2023 to just 1.4% in 2024. ,

4.2. Petroleum products market in Ukraine

In 2023, there was a total of 1,272 entities that imported petroleum products and biofuels into Ukraine, which is a slightly lower number than in 2022, and a significantly higher number compared to 2024. Most of these entities imported diesel fuel or gas oil.

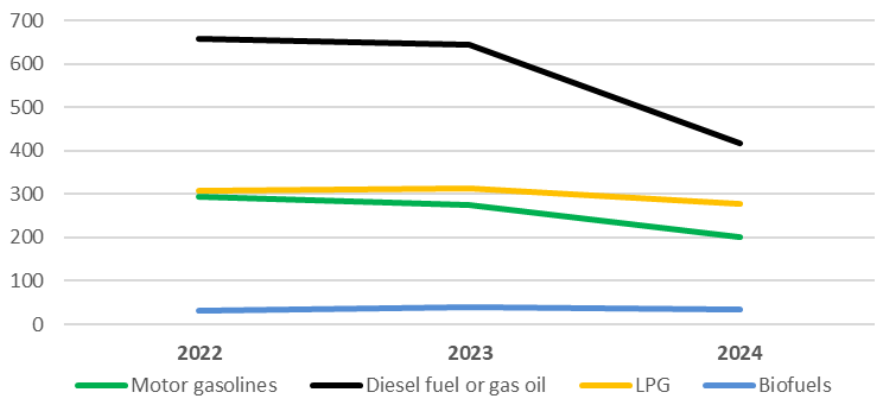


Figure 1. Number of economic entities that imported petroleum products and biofuels into Ukraine
Source: Ministry of Energy and State Agency on Energy Efficiency and Energy Saving

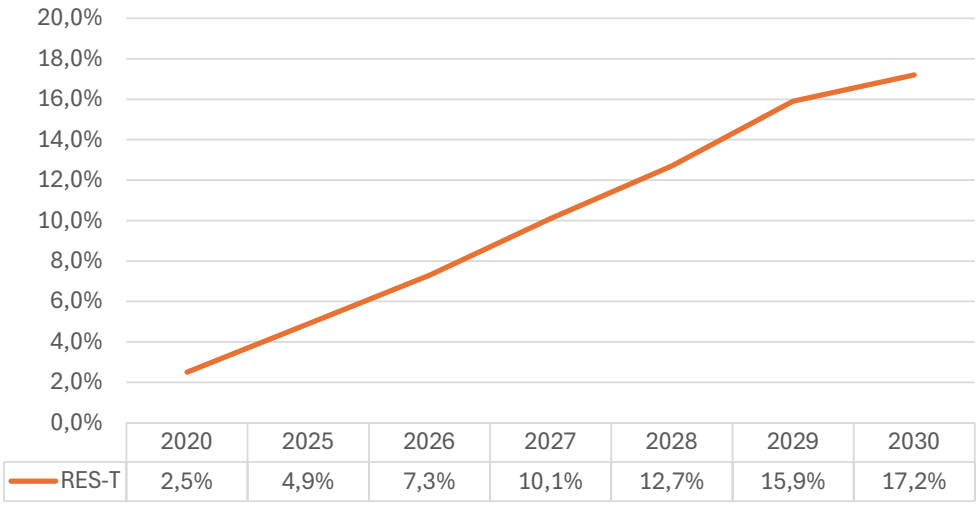
In Ukraine, there was a small consumption of natural gas in road transport (0.3% in 2020). There was a small production of biogas (92.2 ktoe), consumed entirely for electricity and heat generation.

There was no electricity consumption in road transport in 2020, while 80.6% of electricity in the transport sector was consumed in rail transport.

In Ukraine, there are 7 biomethane production enterprises with a total capacity of 111 million cubic meters per year.

4.3. Indicative RES-T targets

The target value of the share of RES in transport sector for Ukraine in 2030, defined by the NECP, is 17,2%, and is in line with RED II requirements. The indicative RES-T trajectory is shown in the figure below.



	2020	2025	2026	2027	2028	2029	2030
RES-T	2,5%	4,9%	7,3%	10,1%	12,7%	15,9%	17,2%

Figure 2. Indicative trajectory of RES Share in transport according to the NECP

5. DESIGN CONCEPTS FOR MAINSTREAMING RENEWABLE ENERGY USE IN THE TRANSPORT SECTOR

The proposed system for meeting the RES-T is based on several key elements:

- Defining the obligation to place renewable energy on the market for transport needs,
- Establishing a system for verification of compliance with the sustainability and greenhouse gas emissions saving criteria and
- Managing and controlling the entire system.

The system defines the parties obliged to place renewable energy on the market for transport needs. Fuel suppliers obliged to place renewable energy in transport are those who place diesel fuel or motor gasoline on the market for road and rail transport and are considered subject to excise duties under a special law regulating excise duties. The amount of renewable energy that the obligated fuel supplier is required to place on the market in a given calendar year is proportional to the amount of motor gasoline, diesel fuel, and natural gas that the obligated fuel supplier puts on the market in that year. The share of renewable energy that the party obliged to place on the market in a given year is equal to the Ukraine RES-T set for that year.

The proposal is that companies with annual deliveries below some threshold (expressed in MJ/year) are exempt from the obligation. This exemption must be defined by the relevant legislation.

Renewable energy that the obligated fuel supplier places on the market must meet the prescribed sustainability criteria to be counted toward fulfilling the obligation and the Ukrainian RES-T goal. Legal framework for the verification of sustainability criteria and greenhouse gas savings and Database for Biofuels (DfB) through which verification is monitored and certificates of sustainability are entered (sustainability certificate) should be established.

In the proposed concept of verification of compliance with sustainability and GHG savings criteria the NAAU accredits the certification body that performs the independent audit of the economic operators under the voluntary scheme. Ministry of Economy, Environment and Agriculture authorises accredited certification bodies to perform verification audits.

Economic operator arranges for independent audit performed by verifiers operating under the certification body. Upon positive results of the verification audit, certification body issues the sustainability certificate that confirms the sustainability and GHG emissions saving compliance and, where required, low indirect land-use change-risk compliance. Certificate enables economic operator to issue Proof of sustainability for each consignment of biofuels. The PoS and additional data are entered into Database or submitted directly to the State Agency for Energy Efficiency. The Database is established, operated and supervised by the Agency. Other relevant actors have access to the Database to submit additional information and verify submitted information by economic operator. Noncompliance within the Database is reported by SAEE to State Environmental Inspectorate. The State Environmental Inspectorate supervises economic operator and certification bodies operating under the voluntary schemes, if it has the competence. Otherwise, the supervision of economic operator should be performed by other state authority responsible for environment.

As such, a database is not mandatory under RED II, in the initial phase, it could be organised through a simple database recording the Proofs of Sustainability and supporting information and documents. The RTF Certificate is issued for each unit of renewable energy that the obligated fuel supplier has placed on the market.

Upon approval from the SAEE indicating that all relevant data had been submitted, the renewable transport certificated (RTF Certificate) are issued to the obligated fuel supplier. The RTF Certificate is issued for each unit of renewable energy that the obligated fuel supplier has placed on the market. The obligated fuel supplier enters the obtained certificate for placing renewable biofuels on the market (RTF Certificate) into the Renewable Transport Fuel Registry (RTF Registry) administrated by authority responsible for energy. Since the SAEE is responsible for the Database, within which it checks and approves documentation and converts the volume fraction of biocomponents into energy content, it is also recommended for SAEE to be a body authorised for RTFO Registry. The obligated fuel suppliers can trade the obtained certificates among themselves through the RTF Registry.

The obligated fuel supplier prepares the Plan for placing renewable energy on the market for transport needs every year for the following year (obligation year). At the end of the obligation year, the obligated fuel supplier prepares the Report on the fulfilment of the obligation to place renewable energy on the market for transport needs. If the obligated fuel supplier has not partially or fully fulfilled its obligation to place renewable energy on the market for transport needs, it must pay compensation for failure to fulfil its obligation.

SAEE also maintains the State Register of business entities that produce and /or sell liquid biofuels, has the role of Biomethane registry administrator and is responsible for issuing of guarantees or origin for biomethane (not shown in the scheme above). It also reports to EnCS on the share of renewable energy in final energy consumption in the transport sector.
The diagram below outlines the concept of verification of compliance with the sustainability and greenhouse gas emissions saving criteria.

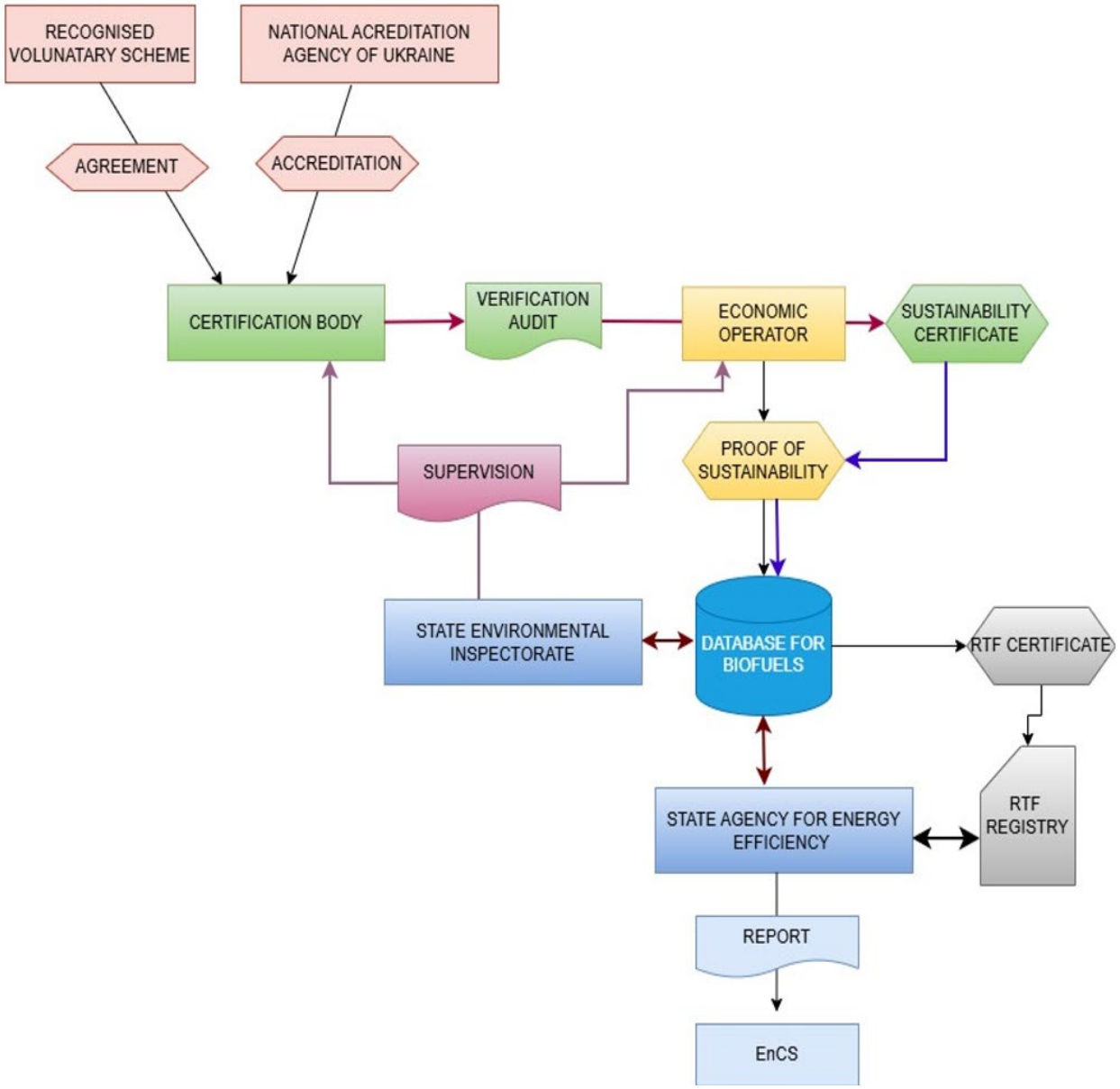


Figure 3. Scheme of proposed institutional responsibilities within then proposed sustainability and GHG emission compliance system

5.1. Concept for implementation, verification and monitoring of the obligation for fuel suppliers to place renewable fuels on the market in Ukraine

5.1.1. Renewable Energy Targets and Timelines

- **Set binding targets:** Ukraine's legislation should define the national RES-T target (e.g. 17,2% by 2030 as per the NECP) in line with RED II's minimum of 14% by 2030. A clear trajectory (e.g. annual intermediate targets or an indicative linear path) provides certainty for planning.
- **Advanced biofuels sub-targets:** Introduce a specific sub-obligation for advanced biofuels (from wastes, residues or Annex IX feedstocks). RED II requires 0.2% of energy in 2022, 1% in 2025 and at least 3.5% in 2030 from advanced biofuels; Ukraine's sub-obligation must be at least as high as those stipulated in RED-II. This encourages next-generation biofuels and ensures innovation.
- **Renewable fuels of non-biological origin (RFNBOs):** The design should explicitly allow renewable hydrogen and synthetic e-fuels (produced from renewable electricity) to count under the RES-T target. In practice, these should be defined as eligible "renewable transport fuels" and counted to reflect their carbon intensity, in accordance with RED II Delegated Acts.
- **Include electricity multipliers:** Mandate that renewable electricity used in transport (e.g. EV charging, electric rail) is in line with RED-II calculation rules. For example, as in the EU, each kWh from renewable sources for road transport could count with multiplicator towards the target. This incentivizes e-mobility.

5.1.2. Obliged Parties

- Define obligated fuel suppliers: Obligations should apply to entity supplying fuel to the market that is responsible for passing fuel through an excise duty point. In practice this means importers and domestic producers of gasoline, diesel and other motor fuels. Entities covered by the fuel excise system would automatically be liable.
- Scope of fuels: The obligation should cover petrol and diesel fuel supplied for consumption or use on the market in the road and rail transport sector. Suppliers of renewable electricity used for transport (e.g. EV charging operators) should be allowed to register so that their supplied kWh can generate RTF certificate. Renewable hydrogen or biomethane suppliers can likewise generate credits if integrated. Any exemptions (e.g. for small operators) or special treatment should be transparent.
- Flexible compliance: To manage market fluctuations, allow obligated parties to meet targets through certificate trading and carry-over. That is, a supplier falling short in one year may purchase excess compliance from another party (via certificates). Excess certificates earned can be carried into the next year. This flexibility helps ensure overall targets are met at least cost. It is not necessary to introduce certificate trading at the initial stage of system implementation. The proposed framework allows for a phased approach, under which the obligation scheme can first operate with direct compliance and administrative allocation of certificates, while certificate trading may be introduced at a later stage once the market and institutional capacity are sufficiently developed.

5.1.3. Tradable Certificate Systems

- Renewable transport fuel certificates (RTFCs): The scheme should create tradable certificates to represent compliance. Each certificate corresponds to 1 MJ of qualified renewable transport fuel. Obligated suppliers receive certificates for the renewable fuel they supply (after verification) and must surrender a number of certificates equal to their obligation.
- Trading mechanism: Certificates can be bought, sold or transferred among parties via

the registry. This enables suppliers who produce or import excess renewable fuel (or purchase it) to sell certificates to others. The option to trade encourages cost-effective compliance: cheap renewable fuels (or excess production) can be monetized, while those struggling to supply enough can purchase credits rather than pay penalties. The legal framework should explicitly permit such certificate trading.

- Certification of units: It is good practice to "colour-code" certificates by fuel category (e.g. separate credit for Annex IX-A fuels vs. conventional biofuels), though this is a technical detail. At a minimum, ensure that advanced fuels (Annex IX-A) and RFNBOs are identifiable, as they often carry double credit.

5.1.4. Obligation Monitoring and Reporting Registry (RTF Registry)

- Electronic registry: An online Registry will be needed to implement the certificate scheme. All obligated parties, including producers of renewable fuel and certifiers, will have accounts on the Registry. Every transaction (fuel reported, certificates issued or surrendered, trades) is logged here.
- Data flow and controls: Fuel suppliers report quantities of each fuel placed on the market each period. The Registry issues RTFCs for eligible fuels as they are reported and certified. At the end of each compliance period (calendar year), the Registry will calculate each party's obligation and outstanding certificates. It will then show who must surrender certificates and who can carry over or sell theirs. This transparent system provides an auditable trail of compliance.

5.1.5. Integration of Renewable Electricity and E-Mobility

- E-Mobility crediting: The scheme should explicitly allow renewable electricity used for transport to earn RTFC credits. In practice, charging stations operators or grid suppliers must be able to certify that kWh come from renewables. Each kWh would count at an established multiplier according to RED II rules. This provides a strong incentive to expand green charging infrastructure.
- Hydrogen and gases: Renewable hydrogen, biomethane and synthetic e-fuels should

be treated as renewable energy in transport as well. National rules should define how these fuels are certified (e.g. by GHG accounting methods under Annex V of RED II).

- System integration: Support measures (e.g. grid upgrades, H_2 corridors) are outside the RTFO per se, but legislation should not preclude counting these technologies. For example, any mandates or incentives to build EV chargers or hydrogen stations will help the RTFO work. In summary, the RTFO design should encompass all renewable transport pathways, liquid biofuels, biogas, hydrogen and electricity, under a unified compliance framework.

5.2. Concept for implementation and verification of sustainability and GHG emissions saving criteria for biofuels, bioliquids and biomass fuels

5.2.1. Recognition of certification schemes, accreditation of certification bodies

- Approval of voluntary schemes: Procedure of the approval of voluntary schemes should beestablished. The national voluntary scheme, if established in the future, must be approved by Energy Community Secretariat.
- Accreditation and authorization of certification bodies: In order to operate and perform independent audits under a voluntary scheme, a certification body must be accredited against EN ISO/IEC 17065, and, when conducting verification activities, also EN ISO/IEC 17029 and EN ISO 14065. The accreditation may be granted by an accreditation body which operates in accordance with EC Regulation 765/2008, either national body of Ukraine (National Accreditation Agency of Ukraine – NAAU) or an accreditation body of an EU Member State or EnC Contracting Party. The accreditation must cover the specific scope of certification under the applicable voluntary or national scheme within the meaning of Directive (EU) 2018/2001, adapted and adopted by Ministerial Council Decision 2021/14/MC-EnC and 2022/02/MC-EnC.
- The list of all accredited and authorized certification bodies and certificates that they have issued for economic operators at the territory of the Republic of Ukraine should be stored in one place, preferably in the Database for Biofuels (DfB).

5.2.2. Establishment of independent audit procedures (sustainability and GHG emissions saving compliance verification)

- Clear guidance on obligations for all economic operators: The legislation should provide clear guidance for economic operators on obligations in terms of sustainability compliance and GHG emissions saving criteria. Economic operators must provide relevant evidence. Required documents include feedstock origin records, GHG methodology, mass balance logs, and management procedures accompanied by relevant certificates. Detailed guidelines should be provided by the voluntary scheme chosen by EO for certification. In the secondary legislation address all economic operators in the supply chain. The fuel supplier is also under the obligation to demonstrate sustainability and GHG emission savings compliance. Every economic operator in the chain of cultivation and conversion of biomass to biofuels must provide purchasers in the next step information about the certificate it has obtained and the sustainability characteristics of the product it delivers.
- Sustainability and GHG emission savings compliance and low indirect land-use change-risk certificate: If compliance is verified through independent audit, the certification body issues a sustainability certificate to the economic operator. The voluntary scheme publishes the certificate in its online registry. The economic operator uploads the certificate to the Database for Biofuels. Sustainability compliance certificates are typically valid for one year, subject to annual surveillance audits by certification body (within six months for waste biofuels). In terms of auditing waste and residues there should be no tolerance to deliberate misstatement of raw material description, falsification of GHG values or input data as well as the deliberate production of wastes or residues. When an economic operator is certified by a recognized voluntary scheme, further evidence of compliance with sustainability criteria is not required.

5.2.3. Reporting information on biofuels and their characteristic

- Establish Database of Biofuels (DfB): The Database for Biofuels is a web-based platform where information is submitted electronically by registered users. The database is established, maintained and updated by authority responsible for environmental protection (DfB administrator). The authority approves requests for registration from the relevant stakeholders. The Database should serve as a central point for biofuel recording and tracking and should enable the upload of certificates of compliance with sustainability and GHG emission saving criteria. Economic operators should be required to enter information on transactions and the sustainability characteristics of the fuels, including life-cycle greenhouse gas emissions. The Database for Biofuels tracks each consignment of sustainable fuel from its entry into the system through to its final use. All economic operators in the renewable transport fuel value chain must register and submit the relevant data, from production through to the fuel supplier placing the fuel on the market, so that the authority can cross-check volumes and ensure no double-counting.
- Registration and entry of information: All operators in the sustainable biofuels sector, covering all liquid and gaseous fuels (excluding solid fuels from biomass) are required to register. These operators include (but are not limited to) the following players:

– economic operator (first gathering points - agricultural biomass and waste & residues, traders, processing plants, fuel suppliers,
– certification bodies;
– voluntary schemes;
– authorities relevant for supervision.

After logging in, users have access to their account and, depending on user role and account, they can:

– enter and transfer data: producer, importer, supplier to the market;
– verify data: certification bodies – verify sustainability certificates;
– perform control: relevant authorities, voluntary schemes (certificates only).

Certification bodies should validate economic operator's registration in the database,

confirm the information entered by economic operators into database (cross check the information entered with the mass balance and proof of sustainability (POS)). Voluntary schemes should approve certification bodies registered and approve certificates issued by certification bodies. Any trade should be recorded in the system. For fuels in interconnected infrastructure subject to the same mass-balancing system, these characteristics must be registered at the first entry point and registered out at final consumption.

- Specify information to be submitted and define the content of PoS in secondary legislation: It will ensure consistency among obliged parties and across different jurisdictions, as well as facilitate the smooth implementation and enforcement of sustainability criteria. Without a clear and standardized framework for PoS, there is a risk of ambiguity, which could undermine efforts to achieve measurable sustainability outcomes and hinder the overall effectiveness of regulatory mechanisms. The regulation should encompass all the data indicated in Annex I of the Implementing Regulation 2022/996 are transmitted through biofuel life cycle chain.
- Maintenance and supervision of the Database: Authority responsible for the Database should take measures to ensure that economic operators enter accurate information into the Database. To ensure transparency, the Database records all biofuel consignments and their certification status, supported by relevant documentation. Accordingly, the system contains all sustainability certificates, Proofs of Sustainability (PoS), transferred (traded) amounts, and submitted reports. The authority performs periodical supervision. It involves checking information, process and relevant documentation submitted. To ensure full transparency over time, the Database could eventually interface with other systems: customs (fuel imports), environmental data, and finance (tax records), to prevent fraud. The database should allow uploading of proof of sustainability certificates and GHG calculations, analogous to the EU's RED-GO (Guarantee of Origin) platform.

5.2.4. Responsibilities and supervision by national authority

- Supervision by national authority: Impose the obligation for the periodical supervision of economic operators by national authority. The economic operator should enable the supervision authority on-site access and provide insight into all documentation related to sustainability and GHG emission savings compliance. Records must be retained for a minimum of 5 years, and upon request, made available to the relevant national authorities. The supervision demands insights into GHG calculation, mass balance, record keeping, certificates, etc. Therefore, it would be reasonable to assign this role to a body competent in environmental protection. The supervision of certification bodies by national authority should also be defined. Ideally, it can be performed by the same as the supervision of the economic operators.
- Non-compliance of irregularities: National legislation should enable the supervision authority to deny certificates or cancel registrations if during the supervision irregularities are determined. Penalties for not meeting the obligation and for malversation and fraud regarding the compliance with sustainability and GHG emissions saving criteria should be defined.

5.3. Institutional Responsibilities for the Implementation of the Proposed Concepts on Renewable Fuel Obligations and Sustainability Criteria

The responsible authorities and their roles in the implementation of the obligation of fuel suppliers to deliver renewable energy to energy consumers in the transport sector are described below:

- Ministry of Energy: Responsible for overall energy and climate policy (including setting RES-T targets, developing legislation) and for the renewable energy sources and renewable gases sectors. It will coordinate with other ministries on implementation.
- State Agency on Energy Efficiency and Energy Saving (SAEE): Tasked with implementing alternative fuel policy, maintaining the Biomethane Registry and issuing Guarantees of Origin for biomethane. SAEE will administer the RTFO scheme (e.g.

operating the Registry) or oversee its execution. The SAEE establishes and manages the Database of Biofuels, collects required information on biofuels from business entities, checks and approves documentation, converts the volume fraction of biocomponents into energy content, and reports any non-compliance with the established procedures for the Database to the State Environmental Inspectorate. It maintains the State Register of business entities that produce and /or sell liquid biofuels. It also reports to EnCS on the share of renewable energy in final energy consumption in the transport sector.

- Ministry for Communities and Territories Development: Oversees transport infrastructure and vehicles, including regulations on vehicle adaptation for alternative fuels. It may be involved in permitting biomethane plants or bio-CNG/LNG infrastructure.
- Ministry of Economy, Environment and Agriculture: Leads in drafting the NECP and promoting renewables. It is responsible for environmental protection, land-use rules, and climate issues, hence overseeing sustainability criteria. It may house the certification oversight function (as the "national authority" for RED II).
- National Commission for State Regulation of Energy and Public Utilities (NCERPU): Regulates energy markets and issues guarantees of origin for renewable electricity. While its main focus is on power and gas, it will also coordinate on cross-cutting issues, such as electricity crediting in transport and overall market monitoring.
- The National Accreditation Agency of Ukraine (NAAU): accredits certification bodies under ISO standards to perform auditing of sustainability and GHG emissions saving.
- State Agency of Reserves of Ukraine (Derzhkomreserv / State Reserve Agency): Although focused on oil reserves, existing functions could be leveraged (if appropriate) to assist in administration. In any case, the Agency tracks fuel imports and could supply data for the scheme.
- State Environmental Inspectorate verifies compliance with the Procedure on confirming compliance. Supervises the economic operator and operation of certification bodies under the voluntary schemes.

- Others: The State Forest Agency (for biomass feedstock checks), Customs Service (for import verification), and State Environmental Inspection all have supporting roles (certification surveillance, border checks). Institutional responsibilities should be clearly outlined in law/regulation for coordination.

5.4. Compliance Mechanisms and Penalties

- Enforcement: The scheme should include strict penalties for non-compliance. Typically, if an obligated party fails to deliver enough certificates by the deadline, it must pay a "buy-out" fee per MJ of shortfall (set above the certificate price). This fee is paid to the government (or a biofuel fund) and is never returned. In practice, the fee serves as a price cap on certificates, discouraging deliberate non-compliance.
- Legal sanctions: In addition to financial penalties, serious breaches (fraudulent claims, false certification data) should trigger administrative sanctions (fines, license suspension). Regular audits and the public nature of the registry data will help detect irregularities. The law should empower the regulator to impose these sanctions to maintain integrity.

6. LEGAL AND REGULATORY FOUNDATION

This chapter reviews Ukraine's existing legal and regulatory framework relevant to renewable energy in transport, assesses alignment with the key provisions of Directive (EU) 2018/2001 (RED II) and its implementing and delegated acts as adapted to the Energy Community, summarises the current status of sustainability certification and GHG accounting in Ukraine, and provides targeted recommendations to close remaining gaps needed to operate a RED-II-compatible Renewable Transport Fuel Obligation (RTFO) and supporting compliance infrastructure.

6.1. Current Legal and Regulatory Framework

6.1.1. International commitments

Ukraine's energy governance framework is shaped by its international commitments, notably the EU–Ukraine Association Agreement (signed in 2014, effective since 2017)[16] and the Energy Community Treaty, which require alignment with EU energy legislation, including RED II. These commitments are reinforced by the DCFTA principles[17], which emphasize transparency, accountability, and effective oversight. Together, they mandate the implementation of governance and regulatory frameworks to ensure sustainable development of the renewable energy sector and compliance with EU rules and standards.

6.1.2. Primary law and legal basis

Ukraine has a clear primary-law foundation for regulating alternative fuels and related instruments:

- Law of Ukraine "On Alternative Fuel" (No. 1391-XIV)[18] amended in 2024 by Law of Ukraine on the Mandatory Use of Liquid Biofuels (Biocomponents) in the Field of Transport (No. 3769-IX)[19], is the principal primary act that now expressly provides legal bases for introducing renewable energy in the transport sector by establishing a mandatory share of biofuels, requiring that, starting from May 1, 2025, liquid biofuels

[16] https://eu-ua.kmu.gov.ua/en/agreement/overview/
[17] https://trade.ec.europa.eu/access-to-markets/en/content/eu-ukraine-deep-and-comprehensive-free-trade-area
[18] https://zakon.rada.gov.ua/laws/show/1391-14#Text
[19] https://zakon.rada.gov.ua/laws/show/en/3769-20#Text

(biocomponents) must constitute at least 5% (±1%) of all motor gasoline sold at wholesale and retail fuel outlets, while also introducing sustainability and GHG emissions savings criteria, along with verification, control, and reporting mechanisms to ensure compliance. Law defines key definitions and legal instruments in accordance with the legal framework of the Energy Community and the EU (Art. 1); outlines the basic principles of state policy in the field of alternative fuels (Art. 2); the characteristics of alternative fuels (Art. 3), the technical means operating on alternative fuels (Art. 7) and the general requirements for administration and state control (Art. 7.1.) identifying responsibilities of the SAEE and the State Environmental Inspectorate in the administration and oversight of the system. It also gives a legal basis for: a national biomethane register (Art. 8.1); Guarantees of Origin for biomethane (Art. 8.2); rules for biomethane export (Art. 8.3); and (crucially) provisions concerning compliance with sustainability criteria for liquid biofuels (biocomponents) and biogas intended for transport, and the sustainability criteria themselves (Arts. 8.4 and 8.5). In addition, the law specifies the offences and penalties for non-compliance with the required mandatory share of liquid biofuels and the untimely submission of information on the content of liquid biofuels (Arts 13 and 14). Finally, it also highlights the international cooperation mechanisms and the supremacy of international treaties over national legislation (Art. 15).

It is important to note that the draft law "On Amendments to Certain Laws of Ukraine on the Implementation of European Union Legislation in the Field of Renewable Energy Sources", reg. No. 14271 dated 03.12.2025,[20] in the finalized version after coordination with the interested central executive authorities. Amendments to the Law "On Alternative Fuels" are being developed by the Ministry of Energy, focusing on terminology, clarifying provisions on sustainability criteria, and on accession to the UDB, and shall serve, after entering into force, a legal basis for further development of secondary legislation.

[20] https://itd.rada.gov.ua/billinfo/Bills/Card/59237

- Other relevant national laws and instruments that interact with alternative fuels include legislation on market surveillance and non-food product control (market surveillance and conformity assessment), draft tax amendments for environmental/carbon taxation, and draft e-commerce enabling rules for fuel trading (all of which may affect how fuel suppliers are registered, supervised, and taxed).

6.1.3. Secondary and draft regulations (status as provided)

Several important secondary texts necessary for operationalising an RTFO and sustainability verification exist in draft form or are under development:

- Draft Technical Regulation on Requirements for Motor Alternative Fuels – prepared by SAEE and submitted for government consideration; sets product-quality, labelling, conformity assessment, and market surveillance rules specific to alternative motor fuels (definitions of E20/E30/E40/E50; B10/B20/B30; passport-of-quality requirements; evaluation and market surveillance provisions). This technical regulation is crucial for ensuring the safe market circulation of biofuel blends and for creating the documentation required by mass-balance and traceability systems.
- Draft Cabinet Resolution(s) to implement RED-II verification rules – drafts prepared by SAEE and the Ministry for Communities and Territories Development address:

(i) rules for verifying sustainability criteria and GHG savings (implementation of the principles of Implementing Regulation (EU) 2022/996);

(ii) procedures for recording the origin of biomass used in fuel production; and

(iii) rules and procedure for accounting for the content of biocomponents in motor fuels and the identification of feedstocks that qualify for double counting.

These drafts form the immediate secondary law package needed to operationalise sustainability verification and the Database for Biofuels (DfB).

6.2. Specific RED II requirements and Ukraine's conformity

Key RED II requirements and the current Ukraine position are summarised below.

1. RES-T target and trajectory (Art. 25 RED II)

   - RED II: Contracting Parties must ensure a minimum share of 14% renewables in transport by 2030 and may set higher national targets; obligations on fuel suppliers are required.
   - Ukraine: NECP set a national target for the transport sector of 17,2% renewables by 2030, thereby providing policy alignment with RED II in ambition, though legislative enactment of the obligation and timeline is required.

2. Sustainability and GHG emissions savings criteria (Arts. 25–31 RED II; Implementing Regulation 2022/996)

   - RED II: Biofuels/biogas/bioliquids counted toward targets must meet strict sustainability and GHG-saving criteria and be subject to verification (mass balance, proofs of sustainability, accreditation of auditors).
   - Ukraine: Law on Alternative Fuels contains sustainability provisions (Arts. 8.4 and 8.5) and the State Agency on Energy Efficiency and Energy Saving (SAEE) has prepared a draft resolution to implement verification rules consistent with Implementing Regulation 2022/996. Drafts foresee the adoption of calculation methods, recognition of voluntary schemes, and supervision arrangements. These drafts demonstrate an explicit intent to align with RED II rules, although the formal adoption of the implementing provisions remains outstanding. Greenhouse gas emissions savings are not addressed by the Law on Alternative Fuels, despite being included in the legal definition of the sustainability criteria, which creates a gap in the full transposition of RED II. However, the draft Regulation on Verification provides instructions for economic operators on how to calculate greenhouse gas

emissions associated with the production and use of biofuels, bioliquids, and biomass fuels

3. Advanced biofuels / Annex IX feedstocks and ILUC rules (Delegated Regulation 2019/807 and follow-up acts)

   - RED II: Sub-targets and favourable counting for advanced biofuels (Annex IX Part A/B) and limits on food/feed crop biofuels to address ILUC risks.
   - Ukraine: The legal and policy documents envisage inclusion of Annex IX feedstocks and double-counting rules (draft order on feedstocks with double counting values), consistent with RED II practice; the full ILUC assessment and legal caps need explicit codification in secondary acts.

4. Database for Biofuels (DfB) and registries (Articles 30–31 RED II / Implementing Reg.)

   - RED II: Member States must ensure traceability via a database and electronic registries linking sustainability data, proofs, and certificates.
   - Ukraine: Drafts envisage creation of a DfB and a national biomethane register; the operational model (DfB → issuance of RTF certificates → RTF Registry) follows the RED-II model.

5. Accreditation and recognition of voluntary schemes (Implementing Reg. 2022/996)

   - RED II: Third-party certification via recognised voluntary schemes (ISCC, SURE, RSB, 2BSvs, etc.) is permitted, with accreditation to ISO standards and state supervision.
   - Ukraine: The NAAU and draft supervision procedures are positioned to accredit and supervise certification bodies; the Ukrainian market already hosts international CBs (Bureau Veritas, SGS, Control Union) who can operate under voluntary schemes. The draft transposition foresees allowing EU-accredited CBs to audit in Ukraine.

6.3. Where alignment is sufficient and where gaps remain

Sufficient or near-complete alignment: policy targets (NECP), primary law enabling sustainability verification, and policy drafts for technical regulation and verification provide a strong basis for RED II alignment. Ukraine has explicitly included relevant RED II concepts.

Outstanding gaps (legal/operational):

1. **Formal adoption and publication** of the draft secondary acts (technical regulation, verification procedures, DfB governance, certificate/regulatory registry rules). Until adopted, operational RTFO instruments lack a legally enforceable basis.
2. **Detailed RTFO enabling regulation**: (i) obligation assignment rules tied to excise procedures, (ii) certificate definitions and tradability rules, (iii) compliance deadlines and buy-out levels, (iv) evidence admissibility rules. These are not yet enacted in a single consolidated instrument.
3. **Operational accreditation and supervision regime** (procedures for registering CBs to be supervised by the State, reporting routines and surveillance audits) needs to be enacted and staffed.

6.4. Recommendations

To ensure a legally robust, RED-II-compatible RTFO and sustainability verification system, the following priority actions are recommended:

Recommendation 1 — Adopt the pending legal amendments and draft secondary legislation without delay

- Update as needed and adopt the drafted secondary legislation, including rules that will enable the technical and procedural frameworks needed for market surveillance and for the DfB and certification systems to function. Formal adoption should include clear commencement dates and transitional arrangements.

Recommendation 2 — Enact a consolidated RTFO instrument (regulation / government decree)

- Draft and adopt a consolidated RTFO regulation (or an amendment to the relevant Law on Alternative Fuels) that specifies:
  - the **obligated fuel supplier** (linked to excise registration);
  - the **certificate unit definition** (e.g., 1 MJ RTF certificate) and the issuance rules;
  - **tradability, transfer and surrender** rules and registry governance;
  - **compliance enforcement** (buy-out fee level, penalties, administrative sanctions);

- **Designate the host authority** (SAEE or a designated agency) for the RTF Registry.

Recommendation 3 — Finalise accreditation and supervision procedures and accept recognised voluntary schemes

- **NAAU** should finalise accreditation guidance for CBs in line with ISO 17065 (and ISO 14065 for actual GHG audits). The national authority should adopt procedures to recognise EU voluntary schemes (ISCC, RSB, 2BSvs, SURE, REDcert, etc.) and to allow EU-accredited CBs to operate under national supervision as foreseen in the draft Regulation on verification. Ensure the supervisory authority has explicit powers to review CB reports and to carry out surveillance audits, as provided by the relevant draft. Regulation

Recommendation 4 —Staffing and enforcement capacity

- Guarantee the supervisory authority has dedicated staff and investigative powers to carry out surveillance audits, cross-checks with customs and to impose sanctions where necessary.

7. CONCLUSION

Ukraine has made significant legal and institutional progress toward transposing RED II requirements: the Law on Alternative Fuels defines the mandatory share of liquid biofuels and creates a framework for monitoring and reporting, contains explicit sustainability provisions and defines a biomethane register authority; the NECP establishes a sufficiently ambitious RES-T target, and draft secondary instruments provide the technical scaffolding necessary for conformity with RED II.

Practical implementation now requires the timely adoption of the pending secondary acts, finalization of RTFO-enabling regulation, operational deployment of the DfB and RTF Registry, accreditation and supervision procedures for certification bodies, and strengthening of statistical and enforcement capacities.

If these measures are adopted in the near term and resourced appropriately, Ukraine will have a legally coherent, RED II-compatible framework to mainstream renewable energy in transport and to verify sustainability and GHG compliance in a transparent and enforceable manner.

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