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FINAL REPORT

Facilitating the Implementation of RED II in the Western Balkans

Bosnia and Herzegovina

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Facilitating the Implementation of RED II in the Western Balkans

Impressum

Title: *Facilitating the Implementation of RED II in the Western Balkans: Renewable Energy in the Transport Sector and Sustainability Compliance in Bosnia and Herzegovina*

Concept for the implementation, verification, and monitoring of fuel supplier obligations and sustainability and greenhouse gas emissions saving criteria

Final Report

Prepared by: Energy Institute Hrvoje Požar

Authors: Rober Fabek
Željka Fištrek
Karmen Stupin
Bruno Židov

Supervision and technical oversight: Energy Community Secretariat

Supervisors: Ana Kojaković
Jacques Isabelle

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Table of Contents

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
DfB	Database for Biofuels
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
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
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 EU Renewable Energy Directive.
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.

List of Figures

List of Tables

1. Introduction and project context

1.1. Project background and rationale

Bosnia and Herzegovina (BiH), as a Contracting Party to the Treaty establishing the Energy Community, 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 neighbouring countries with the aim of creating an integrated, secure, and sustainable energy market. In this context, BiH has committed to transposing Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (RED II), a component of the EU's "Clean Energy for All Europeans" package.

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 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, particularly in BiH.

The rationale for this project is therefore twofold. First, it responds to a clear legal obligation: BiH, as a Contracting Party, must transpose and implement RED II to remain compliant with 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 Bi, ensuring full legal alignment with Directive (EU) 2018/2001 and its implementing and delegated acts 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.
The third 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 ministries, agencies, regulators, fuel suppliers, certifiers, and auditors 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).[1] The 2030 renewables, energy efficiency, and greenhouse gas reduction targets were adopted a year later (Decision 2022/02/MC-EnC)[2].

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

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

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 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. Mainstreaming 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 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.

The sustainability requirements outlined in RED II are the following:

- Biofuels produced from waste and residues derived from agricultural land are eligible only where operators or national authorities have monitoring or have management plans in place in order to address the impacts on soil quality and soil carbon.
- Biofuels produced from agricultural biomass should not be obtained from raw material from land with a high biodiversity value (primarily forests, highly biodiverse grassland, protected areas) that had this status in or after January 2008 (whether or not the land

continues to have that status), unless it can be proven that production of raw materials does not interfere with biodiversity protection purposes. The exact categories of high biodiversity value land are listed in RED II, Article 29, paragraph 3.

- Biofuels produced from agricultural biomass should not be made from raw material obtained from land with high-carbon stock (wetlands, continuously forested areas, other land with carbon stocks) that had this status in January 2008 but no longer has it. This provision does not apply if, at the time the raw material was obtained, the land had the same status as it had in January 2008.
- Biofuels produced from agricultural biomass should not be made from raw material obtained from land that was peatland in January 2008, unless evidence is provided that the cultivation and harvesting of that raw material does not involve drainage of previously undrained soil.

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 emission 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.

Since there was no biofuel production in Bosnia and Herzegovina prior to 2021, the last threshold of at least 65% GHG savings applies in cases where the biofuels consumed in Bosnia and Herzegovina are produced domestically.

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 on 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 Table 2-1, 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 2-1 Decisions, Implementing Regulations and Delegated Regulations supplementing REDII

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 sections 2.3.1.-2.3.3 below) 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.

The approaches to certification in the Netherlands and the Ireland are presented in sections 3.1 and 3.2 below.3.2

2.3.1. 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, 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 Table 2-2.

Table 2-2 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

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

2.3.2. 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 demonstrate 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.

2.3.2.1. 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[3], and accredited to ISO 17065[4], and 14065[5] 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

[3] 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
[4] ISO/IEC 17065:2012 – Conformity assessment – Requirements for bodies certifying products, processes and services
[5] 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[6].
Some well-known certification bodies operating under RED II recognised voluntary schemes include Bureau Veritas, AgroVet, DQS, DNV, SGS, RINA, TÜV NORD, among others.

2.3.2.2. 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[7] or equivalent.

Certification audit refers to auditing:

- Waste and residues
- Actual GHG emission calculations
- Mass balance
- Natural and non-natural highly biodiverse grassland,

Low ILUC-risk certificates are additional to the sustainability and greenhouse gas emissions saving criteria.

These aspects are audited to verify compliance with Articles 29 and 30 of RED II and are further detailed in Implementing Regulation 2022/996[8].

The extent of the audit will depend primarily on the economic operator type (biofuel producer vs biofuel importer) and feedstock for fuels (waste, food and feed corps ...).

For the certification audit, templates of traceability, quantity bookkeeping, mass balance, and GHG emissions must be readily available to the auditor. In the consequent audits, up-to-date records of such data must be available to the auditor.

[6] https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/voluntary-schemes_en
[7] ISO 19011: Guidelines for Auditing Management Systems
[8] 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

Mass balance is one of the components that is addressed in depth. The mass balance system allows mixing of:

- consignments of raw material or fuels with differing sustainability and greenhouse gas emissions saving characteristics in a container, at a processing or logistical facility, or at transmission and distribution infrastructure or site. The information about the sustainability and greenhouse gas emissions saving characteristics and sizes of the consignments remain assigned to the mixture. The sum of all consignments withdrawn from the mixture has the same sustainability characteristics, in the same quantities, as the sum of all consignments added to the mixture.
- consignments of raw material with differing energy content for the purposes of further processing, provided that the size of consignments is adjusted according to their energy content.

If a company holds or has held other similar sustainability certifications within the past year, details of these must be shared, including the scheme name and scope.

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 provide economic operators with instructions and support on how they assess whether raw materials are considered waste and residues.

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.

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.

2.3.2.3. 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.

After certification, the certification body also carries out mandatory surveillance audits which can be carried out quarterly, half-annually or annually. 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.

If a certification body identifies non-conformities, it can suspend (temporarily invalidate) or withdraw the certificate (permanently)

2.3.2.4. 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 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.

2.3.2.5. Supervision by member states

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.

2.3.3. 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).

2.3.4. 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 25–31 of RED II (as it was then applicable in the European Union[9]) 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 BrandstofEenheden*, 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 BiH (e.g. ensuring flexibility, enforceability, data integrity, and administrative feasibility).

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

- Obligated fuel suppliers are primarily fuel suppliers, specifically, companies (and large

[9] 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

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 BrandstofEenheden* (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.

4. Country Context Analysis

4.1. Fuel supply chain of Bosnia and Herzegovina

The petroleum products market in Bosnia and Herzegovina is almost entirely dependent on imports. The production of petroleum products is relatively modest and in 2023 amounted to 13,187 tonnes and refers exclusively to the production of lube oils and lubricants. The total consumption of petroleum products in 2023 amounted to around 1.7 million tonnes, with around 80% being consumed in the transport sector.

Petroleum products are imported to Bosnia and Herzegovina by road and rail, with around 60% of petroleum products imported from Croatia, 20% from Italy, 15% from Serbia and around 5% from other countries.

Total consumption of petroleum products in the transport sector in Bosnia and Herzegovina amounted to about 1.3 million tonnes, with diesel fuel accounting for the largest share (about 84%). Motor gasoline accounts for around 12% of total transport consumption, while LPG accounts for only 4%.

Table 4-3 Balance of LPG, Motor gasoline and Gas/diesel oil in Bosnia and Herzegovina in 2023

T	LPG	Motor gasoline	Gas/diesel oil
Import	83,814	158,130	1,233,807
Export	59	-	-
Total consumption	81,666	157,686	1,243,057
Transport sector consumption	54,709	153,803	1,094,326

Source: Agency for Statistics of Bosnia and Herzegovina (https://www.bhas.gov.ba)

Total consumption of petroleum products in transport sector in Republika Srpska in 2023 amounted to about 0.32 million tonnes, which is about 24% of the total consumption of petroleum products in Bosnia and Herzegovina. Diesel fuel accounts for about 77% of the total consumption of petroleum products in transport, motor gasoline about 16%, and LPG about 7%.

Table 4-4 Balance of LPG, Motor gasoline and Gas/diesel oil in Republika Srpska in 2023

T	LPG	Motor gasoline	Diesel oil
Received	44,233	73,016	486,895
Delivered	13,124	20,030	187,174
Total consumption	30,750	51,649	298,207
Transport sector consumption	20,587	51,471	243,242

Source: Institute of Statistics – Republika Srpska (https://www.rzs.rs.ba/front/article/6849/)

Total consumption of petroleum products in transport sector in Federation of Bosnia and Herzegovina in 2023 amounted to about 0.82 million tonnes, which is about 72% of the total consumption of petroleum products in Bosnia and Herzegovina. Diesel fuel accounts for about 87% of the total consumption of petroleum products in transport, motor gasoline about 9%, and LPG about 3%.

Table 4-5 Balance of LPG, Motor gasoline and Gas/diesel oil in Federation of Bosnia and Herzegovina in 2023

T	LPG	Motor gasoline	Gas/diesel oil
Received	56,618	177,615	1,247,972
Delivered	7,056	88,160	345,682
Total consumption	47,832	90,348	909,340
Transport sector consumption	32,502	87,060	824,484

Source: Federal Bureau of Statistics, Federation of Bosnia and Herzegovina (https://fzs.ba/?s=bilans)

4.2. Petroleum products market in Bosnia and Herzegovina

The supply of the market with petroleum products of the Federation of Bosnia and Herzegovina takes place exclusively through imports and through supply from Republika Srpska. Almost 95% of the total quantities of petroleum products were imported from Croatia, Italy and Serbia. The largest importers of petroleum products:

- Holdina Sarajevo,
- Petrol BH Oil Comp Sarajevo,
- G-Petrol d.o.o. Sarajevo and
- Hifa-Oil Tešanj

participate with about 95% in the total import of petroleum products in the territory of the Federation of Bosnia and Herzegovina.

In the territory of the Federation of Bosnia and Herzegovina, there are about 700 gas stations through which petroleum products are distributed to the market.

The dominant participant in the petroleum products market in Republika Srpska is the company

- "OPTIMA Grupa" d.o.o. Banja Luka,

which deals with the processing and trade of oil and petroleum products, and

- "Nestro Petrol" a.d. Banja Luka,

which carries out retail sales of petroleum products.

Business of "OPTIMA Grupa" d.o.o. Banja Luka includes the procurement of raw materials for processing and production of petroleum products at

- "Oil Refinery Brod" a.d. and
- "Oil Refinery Modriča" a.d.,

as well as the acquisition of final petroleum products and their placement on the market to customers in Bosnia and Herzegovina and abroad.

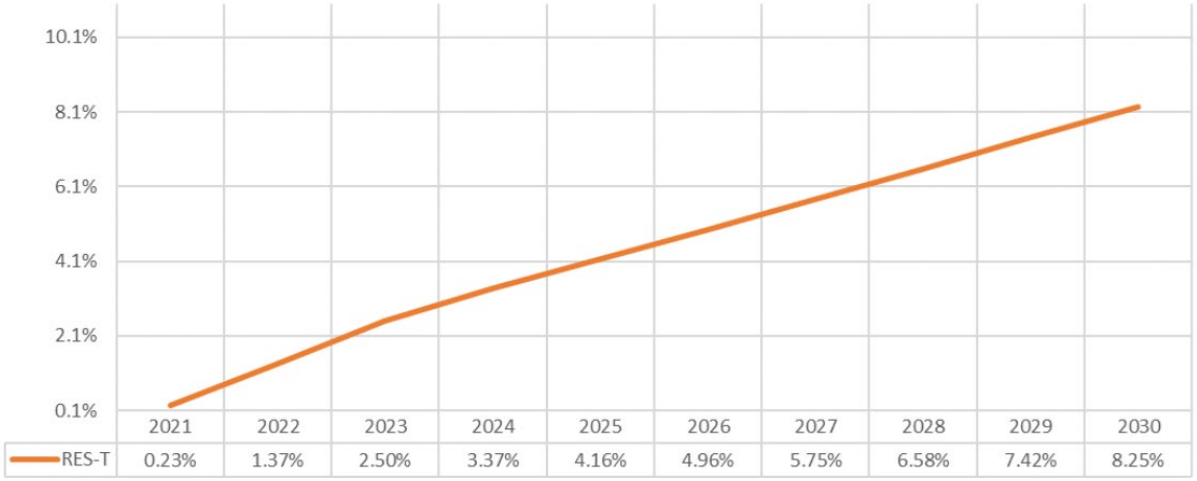
The Regulatory Commission (Regulatory Commission for Energy in Republika Srpska, Regulatory Commission for Energy in Federation of Bosnia and Herzegovina, and The State Electricity Regulatory Commission in District Brcko) regulates activities in the oil and petroleum products sector, namely: production of petroleum products, transportation of crude oil through oil pipelines, transportation of petroleum products through product pipelines, and storage of crude oil and petroleum products.

"Oil Refinery Brod" a.d. has a license in Republika Srpska for the production of petroleum products, i.e. refinery processing, and holds a license for the production of petroleum products and a license for the storage of crude oil and petroleum products. "Oil Refinery Brod" a.d. has not been in operation since 2019. Oil Refinery Modriča a.d. holds a license for the storage of oil and petroleum products.

The retail network of petroleum products is characterized by a large number of small private companies, with less than five gas stations in their ownership, which make up about 75% of the market. About 500 gas stations operate in Republika Srpska.

4.3. Indicative RES-T targets

The target value of the share of RES in transport for Bosnia and Herzegovina in 2030, defined by the draft NECP, is 8.25%.



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
RES-T	0.23%	1.37%	2.50%	3.37%	4.16%	4.96%	5.75%	6.58%	7.42%	8.25%

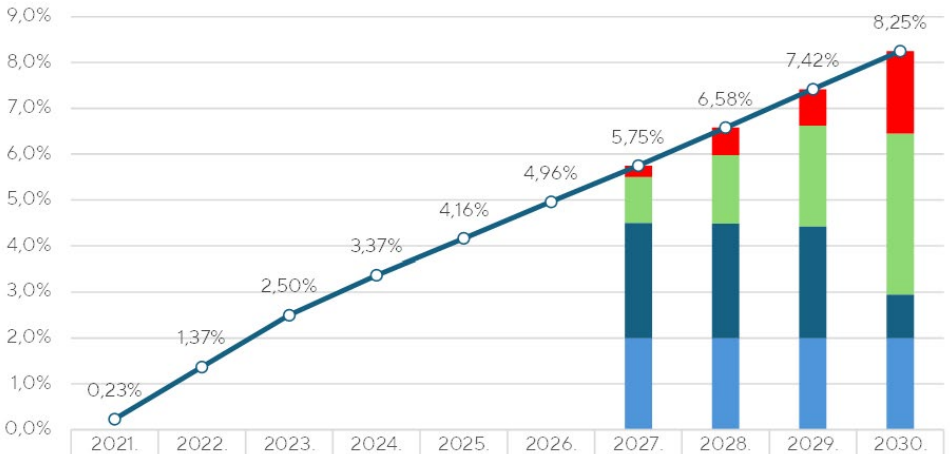
Figure 4-1 Indicative trajectory of RES Share in transport according to draft NECP

The following is a proposal for the distribution of targeted shares of individual renewable energy sources to achieve the overall defined target share of renewable energy in the transport sector.

The achieved RES Share in transport sector in 2021 was 0.24% and is largely the result of electricity consumption in railway transport.

In accordance with the requirements of RED II, the maximum permitted share of renewable energy in transport from biofuels produced from food and feed crops is 2% throughout the entire observed period until 2030. Also, a share of advanced biofuels of 1% is planned in 2027 and its continuous increase to 3.5% in 2030. The contribution of electricity from renewable sources will increase with the development of electrification of road transport and an increase in the number of electric vehicles, and the expected increase is from the current 0.24% to 1.8% in 2030. In order for the electricity used in rail transport to be counted toward the RES shares target in transport, it is proposed to introduce obligation for the use of only renewable electricity in rail transport. Ultimately, as shown in the graph, the difference between the indicative target of 8,25% (in 2030) and the mentioned sub-targets would be made up of biofuels from UCO (taking into account the multipliers offered by RED II).

The proposed distribution considers the multipliers in accordance with RED II.



	2021.	2022.	2023.	2024.	2025.	2026.	2027.	2028.	2029.	2030.
Electricity from RES							0,25%	0,60%	0,80%	1,80%
Advanced biofuels							1,00%	1,50%	2,20%	3,50%
Biofuels from UCO							2,50%	2,48%	2,42%	0,95%
Conventional crop biofuels							2,00%	2,00%	2,00%	2,00%
RES-T	0,23%	1,37%	2,50%	3,37%	4,16%	4,96%	5,75%	6,58%	7,42%	8,25%

Figure 4-2 Indicative targets of RES-T according to type of renewable energy (includes multipliers)

5. Key Design Concept 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
- - Managing and controlling the entire system.

The system defines the parties obliged to place renewable energy on the market for transport needs. Fuel supplier obliged to place renewable energy in transport are suppliers who place diesel fuel or motor gasoline on the market in road and rail transport sectors, who are considered to be subject to excise duties under a special law regulating excise duties and any other entity designated by a Contracting Party. The amount of renewable energy that the obligated fuel supplier obliged 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 put 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 BiH RES-T set for that year, as prescribed by BiH and entity legislation. The methodology for calculating the contribution of individual sources of renewable energy is defined by the Law on Renewable Energy Sources and by-laws.

The proposal is that Companies with annual delivery below certain threshold (expressed in MJ/year) are exempt from the obligation. This exemption must be defined by the relevant legislation. This threshold should be set at a quantity that will exempt from the obligation other suppliers who have placed an exceptionally small quantity on the market in a given year (e.g. a few fuel tanker truck). This could happen, for example, if the supplier started operations at the end of the year. This does not affect the achievement of the overall RES-T target, and reduces the administrative costs of the system.

The renewable energy that the obligated fuel supplier places on the market must meet the prescribed sustainability criteria so that it can be counted towards the obliger's fulfilment and the fulfilment of the BiH RES-T goal. The ministry in charge of environmental protection establishes a legal framework for the verification of sustainability criteria and greenhouse gas savings,

establishes a Database for Biofuels (DfB) through which verification is monitored and certificates of sustainability are entered (Sustainability Certificate), statements of sustainability issued by economic operators (PoS - Proof of sustainability) and certificates for placing renewable biofuel on the market issued by the ministry (RTF Certificate). As such 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. The ministry in charge of environmental protection also supervises economic operators and certification bodies registered in the Database for Biofuels.

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), which is established and maintained by the ministry responsible for energy. The obligated fuel suppliers can trade the obtained certificates among themselves through the RTF Registry. The Ministry approves the Plan for placing renewable energy on the market for transport needs to the obligated fuel supplier, and after the end of the calendar year, it reviews the Report of the obligated fuel supplier on the fulfilment of the obligation to place renewable energy on the market for transport needs and issues a Decision on the fulfilment of the obligation. If the obligated fuel supplier has not partially or fully fulfilled the obligation to place renewable energy on the market for transport needs, the Ministry issues a decision on the payment of the appropriate amount of compensation for failure to place renewable energy on the market.

The ministries responsible for energy and environmental protection should establish a regulatory framework for the establishment of a renewable energy system in transport. Detailed responsibilities of individual stakeholders in the renewable energy system in transport are presented in Chapter 5.7.

5.1. Renewable Energy Targets and Timelines

RES-T trajectory and entity allocation (proposal)

- State-level direction defined by the draft NECP: use NECP's RES trajectory as the binding planning envelope. NECP already projects a significant increase in liquid biofuels and sets overall RES share targets to 2030 (e.g., gross RES share 43.6% by 2030) and sectoral ambitions including planned growth of liquid biofuels to 2030. These figures will serve as the BiH policy ceiling and monitoring baseline.
- Transport specific target (recommended legal text): It is recommended that each Entity takes the necessary measures to ensure that the obligations defined at the state level are effectively transposed and implemented within their respective jurisdictions. In particular, each Entity shall ensure that the share of energy from renewable sources in final energy consumption in the transport sector reaches the trajectory figure set by the NECP, culminating in a minimum BiH average of specific % by 2030 in the final energy consumption in the transport sector. Intermediate milestones set in the NECP should also be incorporated into Entity-level planning.

  In accordance with the requirements of the RED II Directive, the RES-T target is 14%. However, Article 26 of the RED II allows a reduction of the transport renewable energy target if a Contracting Party limits the share of fuels produced from food and feed crops to less than 7%. In BiH, the share of biofuels, bioliquids, and biomass fuels produced from food and feed crops in the energy consumed in road and rail transport must not exceed 2% by 2030, as the share of such fuels in final energy consumption in transport was below 1% in 2022. Consequently, the RES-T target may be reduced by up to 5 percentage points if the share of conventional biofuels is limited to 2%. .

Phased milestones (recommended timetable — example)

Early dates assume regulatory work in 2025–2026; adjust if NECP/legislative decisions come later.

- 2025 (policy year): NECP approved at State level; Entities and District Brcko start adoption/amendment of entity RES laws and draft implementing regulations. Publish implementation roadmap.
- 2026 (pilot / registry build): Entities adopt delegated regulations setting the first binding obligation (pilot level: percentage value consistent with NECP targets). Launch registries and verification procedures (pilot season).
- 2027–2028 (ramp-up): Obligations increase annually; advanced sub-targets are introduced (Annex IXa). Registry interconnection / cross-entity certificate trading enabled.
- 2029 (consolidation): Full enforcement of monitoring, audits, and civil penalties; public reporting for 2028 year.
- 2030: Reach the NECP target (e.g., 8,25% share in transport) and publish NECP compliance report.

Justification: Although currently there are no known investment projects, the phased approach creates investor confidence, minimizes market disruption and allows procurement of audits and registry technology.

Sub-targets and caps (detailed proposal)

- Advanced biofuels sub-target: Require that the biofuels produced from feedstock listed in Annex IX Part A of REDII contribute at least 1% in 2027, rising to 3.5% by 2030 (double-counted where RED II allows) to the share of renewable energy consumed in the final energy consumed in transport. This particular path mirrors conservative investment expectations while incentivising advanced projects.
- Cap on conventional biofuels, i.e. biofuels produced from food and feed crops and high ILUC-risk biofuels: Implement a cap consistent with RED II (e.g., max 2% energy from conventional food and feed crops based biofuels in counting for the obligation), while

the share of ILUC risk fuels should be 0% by 2030, unless they are certified as low ILUC-risk biofuels, bioliquids or biomass fuels.

- Double-counting multipliers: Apply double-counting of energy content for advanced biofuels produced from Annex IX feedstocks and higher multipliers for renewable electricity (see on electromobility).

5.2. Obliged Parties

Definition of obligated parties (prescriptive text)

- Primary obligation: the legal obligation will fall on fuel suppliers – entities that place fuels (used in transport sector) on the market in a given Entity (importers, refiners, wholesale distributors at the excise point). The entity law should define "fuel supplier" as an economic operator registered for fuel excise or VAT purposes and active in that Entity. (*This follows the standard international practice: obligation at supply point maximizes collection and enforcement simplicity.*)
- Exemptions / thresholds: suppliers placing volumes below a de minimis threshold (e.g., X litres/year) may be exempted or subject to simplified reporting to limit administrative burden on small traders. The threshold should be harmonised across Entities.

Special categories

- Electricity suppliers for EVs: suppliers operating EV charging services that either
- purchase electricity and supply it directly for EV charging, or
- own and operate chargers,
- should be eligible to become obligated parties (or voluntary participants) and can generate certificates when supplying renewable electricity to EVs under specified measurement rules. *See integration section*.
- Rail transport operators: In order for the electricity used in rail transport to be counted toward the RES shares target in transport, it is proposed to introduce obligation for the

use of only renewable electricity in rail transport.

Registration and record keeping

- Entity registries must maintain an up-to-date public register of obligated parties (company identifiers, contact, volume thresholds, compliance obligations). This register is the legal instrument for service of notices and fines.

5.3. Verification of sustainability and GHG emission savings compliance

5.3.1. Recognition of certification schemes and accreditation and authorisation of certification bodies

- Establish clear legal framework: Define sustainability and GHG emissions saving criteria requirements according to RED II in the national legislation
- Voluntary schemes: Entity regulation should enable operation of voluntary schemes recognised by European Comission/Energy Community Secretariat (e.g., ISCC, REDcert, 2BSvs) for sustainability criteria and GHG emission savings compliance verification. A possibility for development of national or entity verification scheme in the future should be left in the legislation.
- Allow accreditation and authorisation of certification body: certification bodies performing independent audit in BiH must be either accredited by state accreditation body or accreditation body of an EU Member State or Energy Community CPs. Upon request, the state accreditation body grants accreditation to certification bodies operating under recognized voluntary schemes (VS). A certification body shall be accredited to ISO 17065, and to ISO 14065 where it performs audits on actual GHG values. The entity authority in charge for Database for Biofuels also checks accreditations and approves the certification body and its entry in the Database. The list of authorised accredited auditing (certification) bodies should be available in the

Database for Biofuels (DfB).

5.3.2. Establishment of independent audit procedures

- Provide legal framework on submitting accurate and verified data regarding compliance: The legislation should provide clear guidance for economic operator on obligations in terms of sustainability compliance and GHG emissions saving criteria. Economic operators must provide relevant evidence, demonstrate that chain of custody model is respected, have implemented mass balance system, GHG calculation procedures, and a documentation management system (sustainability characteristics are assigned and tracked through bookkeeping, allowing mixing with non-certified material under strict conditions). Required documents include feedstock origin records, GHG methodology, mass balance logs, and management procedures. Detailed guidelines should be provided by voluntary scheme chosen by EO for certification. Methodology that should be followed for GHG emissions and mass balance is outlined in RED II and respective delegated and implementing acts. Every economic operator in the chain of cultivation and conversion of biomass to biofuels has to provide purchasers in the next step information about the certificate it has obtained and the sustainability characteristics of the product it delivers. This is recorded through Database for Biofuels.

- 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 EO also 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 recognised voluntary scheme, Contracting Party may not require further evidence of compliance with sustainability criteria.

- ILUC treatment: implement ILUC mitigation measures consistent with RED II (caps on high-ILUC feedstocks; preferential treatment for Annex IX feedstocks); these limits must be operationalised in the counting rules.

5.3.3. Database for Biofuels (DfB)

Economic operators are 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.

- Setup, responsibility, maintenance: The Database for Biofuels is a web-based platform where information is submitted electronically by registered users. Platform is restricted to registered users only. The database is established, maintained and updated by entity authority responsible for environmental protection (DfB administrator). The authority approves requests for registration from the relevant stakeholders.
- Registration: 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
  - Entity authorities relevant for supervision
- Information entry and verification: 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, VS (certificates only)

The selection of biofuel, bioliquid or biomass fuel in the platform is important. There should be several general categories to select from: advanced biofuels, Annex IXb fuels, conventional biofuels, electricity, RFNBO.

The registered economic operators are required to transmit the following information to the DfB:

- Information on raw materials (from the 1st collection point),
- Details of sustainability and greenhouse gas emission savings,
- Material processing/conversion
- All transaction data concerning shipments (purchase and sale) of raw materials or fuels.
- Fuel suppliers should enter obligation.

Detailed list of all data is presented in chapter 2.3.2.4.
Independent auditors (certification bodies) should:

- Validate economic operator's registration in the database
- Confirms the information entered by EO into database (cross check the information entered with the mass balance and proof of sustainability (POS)).

Voluntary schemes should:

- Approve certification bodies
- Approve certificates

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.

- Issuing RTF Certificate: After the data for sustainability criteria and GHG emissions data are completed, the RTF Certificate is automatically issued.
- Supervision of Database: Entity authority responsible for the Database should take measures to ensure that economic operators enter accurate information into the relevant 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.
- In order 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.

5.3.4. Supervision by Entity authority

- Assign an Authority in charge for supervision of compliance with sustainability and GHG emissions saving criteria . Supervision of the economic operator and certification body is done under the jurisdiction of entity authority for environmental protection. The authority can perform supervision itself or appoint independent experts with competence and capacity for supervision. They should have access to data in the Database, all relevant records and documentation, right for site visits and inspection of all actors in the supply chain. It performs periodic supervision of certification bodies and economic operators. RED II prescribes that non-compliant fuels cannot be counted towards the target. National legislation should enable the supervision Authority to deny certificates or cancel registrations if criteria are not met.

- Economic operators must keep documentation on sustainability and GHG emissions saving evidence for minimum 5 years and make it available to supervisors and verifiers upon request. Audit reports and verifier certificates must be uploaded to the Database or linked via Database records.
- Non-compliance or irregularities are reported to the MOFTER which notifies the relevant voluntary scheme and the Energy Community Secretariat. Clearly define penalties for not meeting the obligation and for malversation and fraud regarding the compliance with sustainability and GHG emissions saving criteria.

The general structure of the system for Bosnia and Herzegovina is described above is summarised in the Figure 5-1.

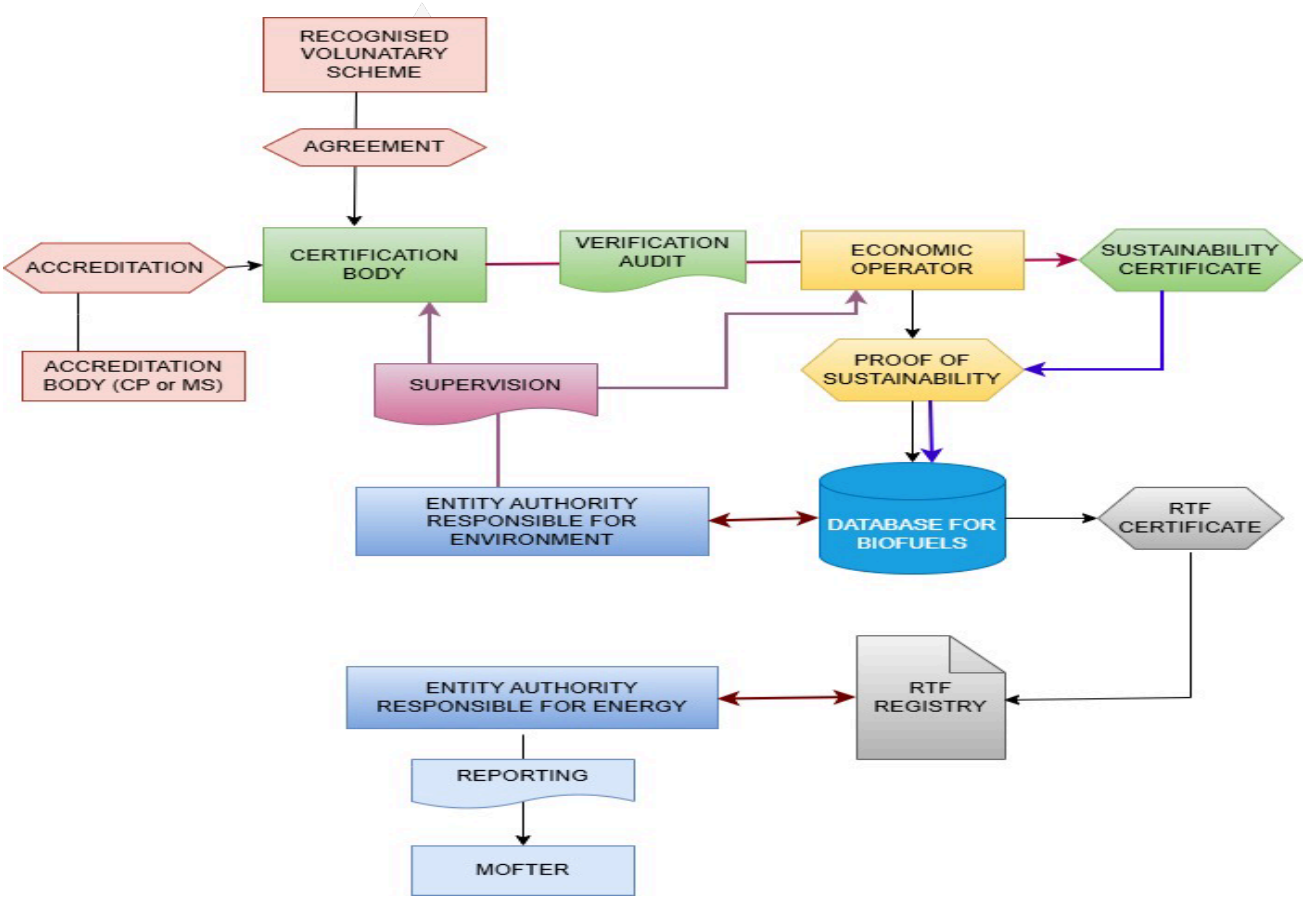


Figure 5-3 Scheme of proposed sustainability and GHG emission compliance system for Bosnia and Herzegovina

Accreditation body accredits certification body for compliance verification under the voluntary scheme. The certificate confirms the sustainability and GHG emissions saving and low indirect land-use change-risk compliance and enables economic operator to issue Proof of Sustainability for each consignment of biofuels. The data are entered into Database for biofuels managed by authority responsible for environment. Through the Database the renewable transport certificated are issued for obligated fuel supplier. The RTF Certificates are uploaded in the RTF Registry administrated by authority responsible for energy. The authority responsible for environment supervises the certification body and economic operator.

5.4. Tradable Certificate Systems

Each Entity establishes a **tradable Renewable Transport Certificate (RTC)** system (it may be implemented as a separate module of an Entity registry).

RTCs are issued to obligated parties or producers who place compliant renewable fuel (or electricity for transport) onto the network. Certificates represent **1 MJ** (or a clearly specified energy unit) of compliant renewable transport energy after sustainability verification. Certificates may be weighted (multipliers) by feedstock type according to rules in regulation (advanced feedstocks, electricity, e-hydrogen).

Entity RTC registries must be interoperable and mutually recognise RTCs issued in the other Entity and Brčko District.

Issuance rules

- **Issuance triggers:** one RTC per 1 MJ of verified renewable energy actually placed on the market in the relevant Entity.

  For electricity: issuance requires metered kWh at the charging point, conversion to MJ, and proof of renewable origin (GO or direct allocation) and anti-double-counting checks.
- **Weighting / double counting:** RTCs are weighted when produced from Annex IX feedstocks (e.g., 2 RTCs per 1 MJ where RED II double-counting applies). Weights and caps must be explicitly stated in the regulation, with an annex listing the eligible feedstocks.

- Validity and expiration: Certificates should have a defined validity period (e.g., transferable and valid for 12 months from issuance). Unretired certificates after the annual surrender date may be cancelled or carry a monetary penalty.

Trading and cross-entity recognition

A tradable certificate market promotes cost-efficient compliance, mobilises private trade and investment, and reduces administrative burden by enabling market-driven allocation of compliance cost (best practice from Ireland and the Netherlands).

- Trading platform: registries must allow transfer of RTCs between accounts and support a public ledger of transfers. Entities should interconnect registry ledgers via a secure API and adopt a harmonised messaging standard (ISO-like). The Council of Ministers should approve the technical protocol (or an Inter-Entity Protocol under MOFTER facilitation).
- Cross-entity surrender: an obligated party may settle its obligation by surrendering RTCs from any Entity, provided the issuing Entity and its registry rules are compatible (mutual recognition). To support reciprocity, Entities must adopt identical counting rules and accepted voluntary schemes.

5.5. Obligation Monitoring and Reporting Registry (RTF Registry)

Registry governance and hosting options

Three feasible options (ranked by recommended preference) are identified:

- **Entity-hosted registries + interconnection:** Each Entity builds and operates its own Registry but accepts interconnection and mutual recognition via a common protocol (fastest to implement and consistent with Entity legal competence). The MOFTER / Council of Ministers sponsors the interconnection technical specification and verifies interoperability.
- **Shared hosted service (preferred for cost efficiency):** an entity designated by agreement (e.g., an Entity regulator or a new shared IT agency) hosts a single platform with separate entity ledgers (logical separation). This reduces costs and simplifies state reporting.
- **State-level hosted registry (least preferred legally):** create a new state institution to host registry — feasible only if constitutional review confirms competence.

Option 2 is operationally and politically pragmatic provided the hosting entity is agreed by administrative protocol and operates under a service level agreement with Entities.

Functional requirements (minimum)

- **Secure user accounts** for obligated fuel suppliers, verifiers and regulators.
- **RTF Certificate submission to RTF Registry** and cross check with the Database for Biofuels should be enabled to for the confirmation that fuels placed on the market fulfils the sustainability criteria and GHG savings.
- **Transfer / trading module** with audit trail and public transaction transparency.
- **Surrender / compliance module**: supports annual surrender returns, automatic shortfall calculations, invoicing of buy-out payments.
- **Reporting and API**: structured machine-readable export for state/international

reporting (Energy Community / Eurostat), and integration with customs / excise databases for fuel volume reconciliation.

- Data retention: all transaction documents retained for minimum 5 years.

Metering and evidence (electricity and liquid fuels)

- Electricity to EVs: evidence must include smart-metered kWh data at charging points, signed supplier declarations, GO cancellation references, and contractual evidence linking production asset and charging point where direct attribution is used.
- Liquid fuels and biofuels: evidence packages follow mass-balance approach: batch certificates, shipping documents, sustainability certificates from recognised schemes, and auditor verification reports.

5.6. Compliance mechanisms and penalties

Surrender deadline and compliance cycle

- Annual compliance: obliged parties must surrender RTCs (or make buy-out payments) by 30 April for the prior calendar year (example date; the actual date should be fixed by entity regulation). The registry should lock the previous year ledger on 31 March and open surrender on 1 April. (*Standard schedule derived from regional RTFO practice.*)

Buy-out / alternative compliance payment

- Design: introduce an Alternative Compliance Payment (ACP) (buy-out) as a capped, predictable safety valve for obligated parties. Suggested initial ACP level: e.g. EUR 0.01–0.05 per MJ of shortfall (this corresponds to several euro cents per litre equivalent and should be indexed annually to inflation). The ACP should be set by regulation with a statutory review clause. (Why: balance enforcement with market flexibility; this range is consistent with regional precedents and keeps the ACP below

expected marginal avoidance costs while providing a credible incentive to comply.)

- Use of ACP revenues: earmark collections to a dedicated Renewable Fuels Support Fund at Entity level to co-finance advanced fuel demonstration projects, certification cost relief for small producers, and registry maintenance

Penalties and enforcement

- Tiered penalties: a three-tier approach:
  - Administrative fines for reporting omissions (moderate fixed fines).
  - Financial penalties proportionate to shortfall beyond ACP (e.g., multiplied shortfall value + penalty factor).
  - Criminal or large civil sanctions for deliberate fraud (e.g., up to multiples of ACP and confiscation of illegally claimed certificates).
- Audit and remedial powers: regulators must have explicit legal powers to audit, freeze certificates under investigation, and require correction documentation.

5.7. Institutional responsibilities

Below is a diagram of a renewable energy system in transport, showing the key stakeholders and their roles in the system.

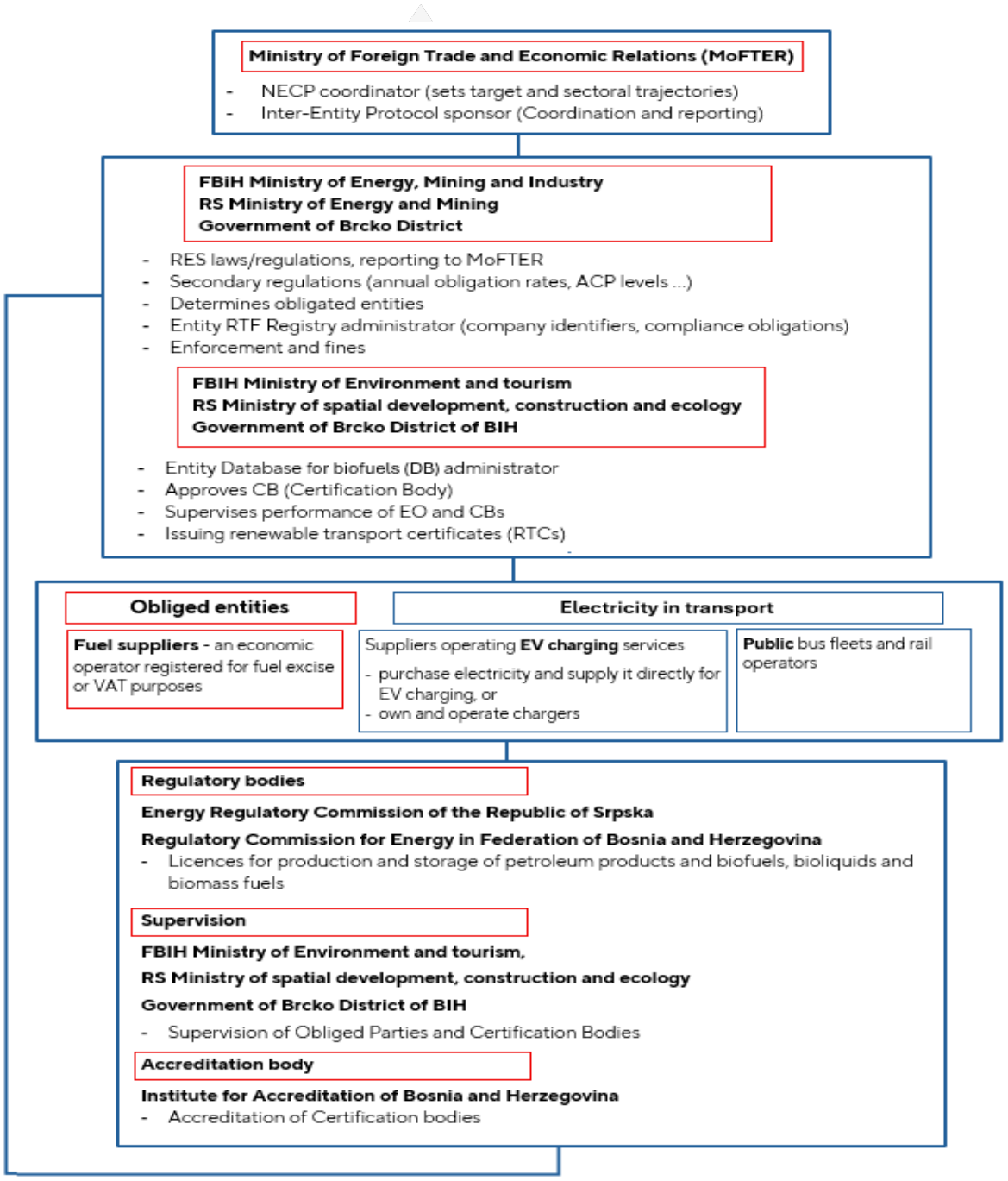


Figure 5-4 Scheme of renewable energy system in transport

State (MOFTER / Council of Ministers)

- NECP owner and coordinator: prepares and updates NECP, sets RES-T target envelope and sectoral trajectories; conducts international reporting to the Energy Community and other fora. (*NECP assigns MOFTER this coordinating role*).
- Inter-Entity Protocol sponsor: facilitate conclusion of the mutual recognition and registry interconnection protocol, and host the master technical specification documents.

Entity Ministries

FBIH Ministry of Energy, Mining and Industry, RS Ministry of Energy and Mining) and Government of Brcko District of BIH

- Primary implementers: adopt or amend RES laws/regulations to transpose NECP targets into domestic obligations; issue entity-level implementing secondary regulations (annual obligation rates, ACP level, annex lists of feedstocks).
- RTF Registry administrator: either host the registry or contract an IT service provider; maintain the public register of obligated parties and verifiers.
- Enforcement and fines: energy regulators or designated inspectorates exercise audit and enforcement functions, issue sanctions and manage compliance procedures (license suspension where applicable).
- Reports to MoFTER.

FBIH Ministry of Environment and tourism, RS Ministry of spatial development, construction and ecology) and Government of Brcko District of BIH (through Environmental Agencies)

- Entity Database for Biofuels administrator: establishes, maintains, approves registration, monitors the Database
- Approves CB: either based on accreditation in other MS or accredited by Institute for Accreditation of BIH.

- Issues RTF Certificates through the system when the compliance is confirmed.
- Supervises performance of EO and CBs through the Database and onsite (for EOs only) either themselves or they outsource a competent authority for this task.

Entity regulators

- Licences for production, storage and wholesale of petroleum products and biofuels, bioliquids and biomass fuels.

Customs, excise and tax authorities

- Data reconciliation: customs and excise authorities must provide fuel import and production data feeds to the registry to validate fuel volumes and reconcile these with declared renewable volumes.

Market actors and stakeholders

- Obligated parties: responsible for registration, surrender, submission of evidence, and payment of ACP or fines.
- Certification bodies and auditors: accredited to verify sustainability and GHG claims.
- Market operator / registry administrator: perform the technical operation and provide customer support.

5.8. Integration of renewable electricity and e-mobility

Counting electricity used for road transport

- Metering and attribution principle: electricity consumed at a charging point is eligible if metered, and only where the renewable origin is demonstrable. Acceptable evidence chains:
    1. Direct physical link: producer directly supplies charging infrastructure (direct contract), and production and consumption metering are auditable; or
    2. GO-backed approach: charging supplier procures Guarantees of Origin (GOs) and cancels them for the corresponding kWh supplied to EVs; or
    3. Hybrid: combination of scheduling and GOs where direct physical attribution is not feasible.
- Multipliers: apply efficiency-reflecting multipliers to electricity kWh à GJ conversion for RTC issuance (e.g., 1 kWh counts as X GJ depending on conversion and policy multipliers). NECP and RED II allow double counting / multipliers to recognise higher well-to-wheel efficiency. Final multipliers should be specified in regulation and consistent across Entities.

Charging station reporting

- Operators must report electricity volumes delivered to EVs and supply evidence (smart meter logs). Distribution system operators (DSOs) provide monthly aggregated data.

Hydrogen and e-fuels

- Recognition of renewable hydrogen (RFNBOs): regulation should explicitly include renewable hydrogen and e-methane as eligible fuels; issuing of RTCs requires proof of renewable electricity input and electrolysis GHG accounting. For 2030 these volumes may be small, but legislative clarity accelerates investment. (*NECP notes hydrogen introduction in longer term*).

5.9. Phased implementation plan and timeline

Phase 0 — Preparation (0–6 months):

- NECP finalised and Council decisions confirm the transport trajectory (State).
- Inter-Entity Protocol negotiated; decision on hosting model.

Phase 1 — Legal adoption (6–12 months):

- Entities adopt or amend RES laws and issue primary legal authority for RTFO and registry.
- Secondary regulations drafted (targets for 2026–2030, ACP level, multipliers, sustainability annexes).

Phase 2 — IT and Operational rollout (12–24 months):

- Registry built/commissioned; APIs and customs/ excise feeds integrated.
- Accreditation of verification bodies; training of auditors.

Phase 3 — Pilot year (Year 2 after legal adoption):

- First obligation year at conservative level.
- Registry operates with limited issuance and pilot trading allowed.

Phase 4 — Scale up to full operation (Years 3–5):

- Ramp obligations to meet NECP trajectory; full audit and enforcement capability active.
- By 2030 reach NECP target.

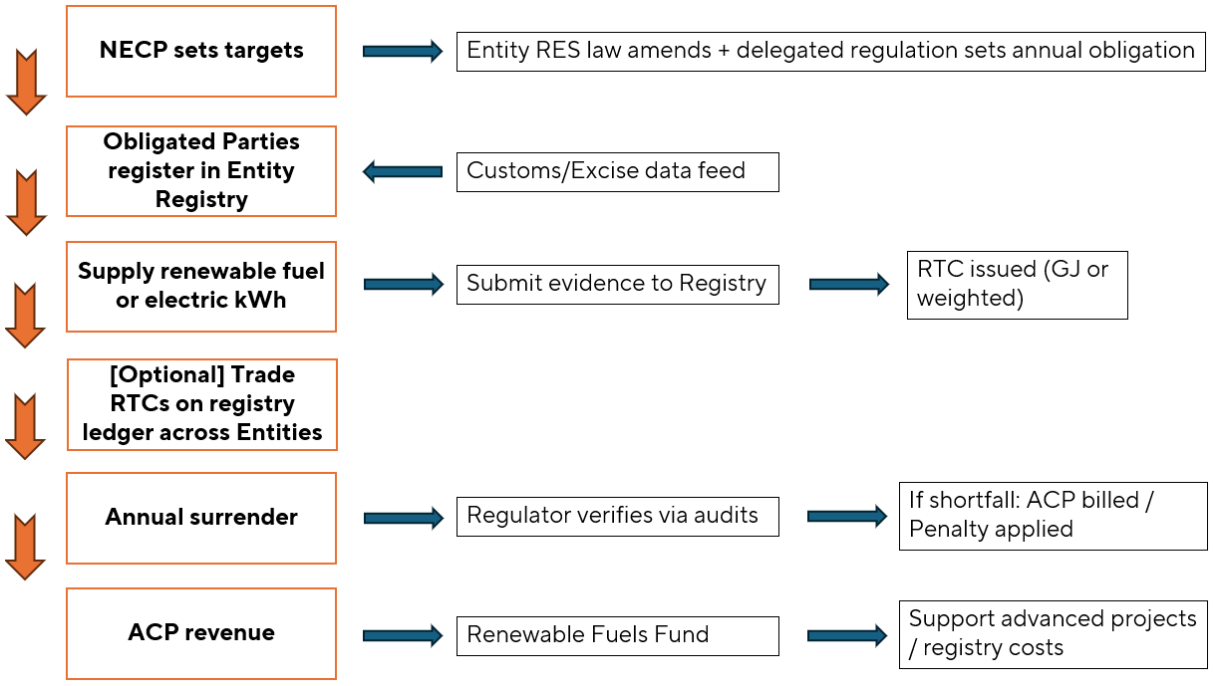


Figure 5-5 Operational schematic — simplified obligation flow

6. Legal and Regulatory Foundation

6.1. Current situation — state vs entity competencies

Bosnia and Herzegovina's constitutional structure assigns wide regulatory responsibilities to Entity levels (FBIH, RS) and Brčko District; state-level bodies (e.g., **Ministry for Foreign Trade and Economic Relations (MoFTER) / Council of Ministers**) retain NECP development, international reporting and limited cross-cutting competences.

The NECP draft identifies MoFTER (and the Council) as proprietor of the NECP and the coordinator of BiH targets, while entity ministries are responsible for implementing measures and secondary regulation in their territory. This division is explicitly reflected in the NECP measure lists and institutional assignments.

Because primary legislative competence over energy and environmental permitting sits largely with entities, **the RTFO must be implemented by harmonised entity laws and implementing regulations** that mirror State NECP targets.

A separate, new State law imposing entity-level obligations would be constitutionally risky and operationally redundant. The legal design should therefore be:

a) State sets targets and methods in NECP,
b) Entities adopt or amend their RES laws / sectoral regulations to transpose those targets and operational rules, and
c) mutual recognition / data exchange is guaranteed by inter-entity administrative agreements and Council of Ministers decisions where necessary (e.g., for international reporting).

6.2. Required changes / harmonisation

1. NECP Binding Entity Targets: The NECP should include the BiH target (transport RES share trajectory) and require each entity to adopt the entity-level transport target consistent with the BiH trajectory (e.g., RES-T share sub-target expressed as % on the entity level should be equal to NECP target).

   The draft NECP already sets out trajectory and sectoral measures (liquid biofuels growth, cap assumptions) but missing sub-targets. Make this clear in a NECP clause and add a timetable for entity implementation. Specifically, it is necessary to define an annual trajectory that clearly sets out, for each specific year, the target and sub-target covering biofuels produced from food and feed crops, biofuels produced from feedstock listed in Annex IX of RED II, renewable electricity, etc. (*Reference: draft NECP measures and timelines*).
2. Entity RES Law amendments: Each Entity must adopt or amend its RES law (or the sector regulation) to:
   - Recite the NECP transport targets and commit to implementing obligation mechanism to meet them.
   - Provide the legal basis for issuing renewable transport certificates (RTCs), for recognizing sustainability certificates, and for establishing an electronic registry.
3. Harmonised definitions and counting rules: All Entity laws must share identical definitions (fuel supplier, renewable transport fuel, advanced biofuel, double-counting multipliers, energy units (e.g. MJ), measurement rules, double-counted feedstock list—Annex IX). Harmonize these definitions with RED II language and NECP references.
4. Delegated powers and secondary regulation: Entities should delegate operational detail (annual obligation rates, administrative fees, and technical annexes) to secondary regulations adopted by the Government/Ministry decree. This ensures parliamentary approval of objectives while giving executive agencies the agility to change annual targets.

5. Inter-Entity Administrative Agreement: The Council of Ministers (or MOFTER acting as lead) should facilitate and sign an administrative Protocol with the two Entities and Brčko District establishing: mutual recognition of certificates; technical standards for registry interconnectivity; joint interface with Energy Community / EU reporting; and a dispute resolution procedure.

Such a design respects constitutional competence provides legal certainty to investors and obligated parties and produces a single effective market through mutual recognition rather than creating multiple, competing state and entity systems.

6.3. Recommendation for further Legislative development (how to convert this concept into Entity law)

1. Entity RES Law — required clauses
    - A clause referring to NECP targets and binding obligation to implement a tradable certificate mechanism.
    - Delegation authority for Government / Ministry to adopt secondary regulations setting annual rates, multipliers and ACP.
    - Empower regulators for registration, audits, penalties and registry oversight.
2. Entity implementing regulation (transport / RTFO) — must include
    - Definitions and counting rules (Annex: feedstock lists including Annex IX lists).
    - Sustainability and GHG savings criteria and verification procedure
    - Obligation calculation methodology (energy content conversions).
    - RTF Certificate issuance rules, multipliers, and certificate lifetime.
    - Reporting templates and procedures (producer, supplier, public transport, EV chargers).
    - Accreditation rules for verifiers
    - Operational rules for Database and Registry, APIs, data retention and public transparency requirements.

- Compliance calendar (dates for issuance, surrender and audits).
- Penalty schedule, ACP calculation and fund management rules.

3. Administrative protocol between Entities
   - Mutual recognition clause for RTCs.
   - Technical interconnection standard.
   - Single point of contact for Energy Community / Eurostat reporting.

7. Conclusion

This Report presents a clear and practicable pathway for Bosnia and Herzegovina to implement RED II requirements for renewable energy in the transport sector by combining international best practice with a tailored, entity-aware legal and institutional design. The analysis demonstrates that a tradable-certificate obligation model, supported by robust sustainability verification and a Database for Biofuels, provides the most effective balance between market flexibility and regulatory control; issuance, trading and surrender of Renewable Transport Certificates should be grounded in verifiable Proofs of Sustainability and interoperable registry interfaces to prevent double-counting and fraud.

The report's country-level assessment shows that Bosnia and Herzegovina's heavy reliance on imported petroleum products and its complex constitutional distribution of competences require a hybrid implementation: the NECP should set the RES-T trajectory, and entities should adopt harmonised RTFO provisions and interoperable registries that respect constitutional competencies while delivering a single, functional market outcome. Practical design choices, including clear definitions of obligated parties at the excise point, de minimis thresholds to limit burdens on small traders, caps on food- and feed-based biofuels, and progressively rising sub-targets for advanced feedstocks, are presented alongside phased timetables that allow pilot testing, registry rollout and progressive enforcement through to 2030. These design elements are complemented by detailed recommendations for accreditation and supervision of certification bodies, mass-balance bookkeeping and audit procedures that align with RED II and the Implementing Regulation 2022/996.

Institutional arrangements emphasise the need for a designated supervisory authority, robust data reconciliation with customs and excise records, and an inter-entity administrative protocol to govern mutual recognition and registry interconnection. The proposed compliance framework combines tradable certificates with a structured buy-out mechanism and graduated enforcement powers, providing predictable incentives for market compliance while retaining strong anti-fraud safeguards and long-term audit capabilities. Integration of renewable electricity, biomethane and RFNBOs is set out through meter-level evidence, Guarantees of Origin or hybrid approaches, with conversion factors and multipliers to reflect efficiency and ensure consistent accounting.

Taken together, the proposed measures form a cohesive, operationally realistic route to full RED II alignment that minimises administrative burden where possible, protects environmental integrity through strict sustainability and ILUC safeguards, and creates a transparent, investment-

friendly market for advanced and renewable fuels. The next decisive steps are adoption of harmonised entity-level secondary regulations, implementation of the entity registries and supervision arrangements, and targeted capacity building for regulatory bodies, certification auditors and obligated market actors. With these steps implemented according to the recommended phased timetable, Bosnia and Herzegovina will be positioned to meet its Energy Community obligations and achieve verifiable greenhouse-gas reductions in the transport sector.

Energy Community Secretariat

Energy Community Secretariat
Am Hof 4, Level 5, 1010 Vienna, Austria

energy-community.org
info@energy-community.org
0043 (0)1 535 2222