

KENYA'S GUIDELINES ON GREEN HYDROGEN AND ITS DERIVATIVES



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ISSUED BY THE ENERGY AND PETROLEUM REGULATORY AUTHORITY

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PREAMBLE

Kenya is committed to the global decarbonisation agenda. Green hydrogen is poised to play a significant role in Kenya's energy transition, leapfrogging the country's clean industrial development and contributing to socioeconomic development. Enablers of the green hydrogen economy include a transparent and predictable policy and regulatory framework, availability of renewable energy sources, developed infrastructure and a ready market.

The Energy and Petroleum Regulatory Authority (the Authority) is responsible for technical and economic regulation of Kenya's electric power, renewable energy, and petroleum subsectors. The Authority is established under section 9(1) of the Energy Act, 2019.

The Authority has developed *Kenya's Guidelines on Green Hydrogen and its Derivatives* (Guidelines) in pursuance of its mandate and in consultation with industry players. The Guidelines provide a stepwise guide on the sustainability criteria for green hydrogen and its derivatives in Kenya, relevant statutory requirements, standards and a monitoring mechanism for projects under development. They assure investors, developers and users of green hydrogen and its derivatives of a level playing field and certainty in the regulatory environment. Further, the Guidelines are a milestone under the *Green Hydrogen Strategy and Roadmap for Kenya* that defines the country's short- and medium-term goals towards a green hydrogen economy.

The Guidelines are divided into ten (10) sections. Section one provides background and context to the Guidelines and includes the purpose, scope, and sustainability criteria. Sustainability is defined in terms of the source of electricity, water, land and local communities. The second section provides guidelines on hydrogen production and its transformation into ammonia and synthetic fuels. Guidelines on health and safety, register of projects, local content, incentives, commencement date, transition, complaints handling and review make up the subsequent sections.

DEFINITION OF TERMS

This section defines and explains several terms used in *Kenya's Guidelines on Green Hydrogen and its Derivatives*. Unless the context otherwise requires, the following words shall have the meaning as defined when reading and interpreting these Guidelines,

Authority	means the Energy and Petroleum Regulatory Authority established under section 9(1) of the Energy Act No. 1 of 2019.
Captive renewable energy	means a power plant meant for generating electricity using a renewable energy source, for own use or sale, installed at the point of use.
Derivatives	means products resulting from processes where green hydrogen is used as a feedstock such as green ammonia and synthetic fuel. Therefore, the products will be stated as “green”.
Developer	means a person or entity engaged in the implementation of green hydrogen (and/or its derivatives) projects.
Green Hydrogen Program Coordination Committee	a multisectoral committee to provide strategic guidance on the implementation of the <i>Green Hydrogen Strategy and Roadmap for Kenya</i> .
Grid	means the national integrated power delivery system that transmits and delivers electric power to consumers at any voltage level.
Host county government	means the county government within whose boundaries a developer operates.
Kenya Green Hydrogen Secretariat /Secretariat	means the “one-stop-shop” established under the Ministry of Energy and Petroleum to coordinate the implementation of green hydrogen projects.
Sustainably sourced biomass	refers to organic materials derived from plants and animals that are obtained and used in a manner that is environmentally responsible, economically viable, and socially equitable. This sourcing ensures that biomass production does not lead to deforestation, loss of biodiversity, or significant greenhouse gas emissions. It also considers the long-term viability of the biomass supply without compromising the needs of future generations.





1 INTRODUCTION

1.1. Background

Kenya is one of the largest and fastest-growing economies in East and Central Africa. Its strategic location, skilled workforce, developed physical infrastructure, enabling policy and regulatory framework, democratic governance structure, and nearly 100% renewable energy power generation makes it a vibrant economy attractive to green investments.

Kenya's development blueprint: Vision 2030, seeks to transform the country into a middle-income economy by 2030 through sustainable growth and by elevating the quality of life for its citizens. This is currently being implemented through the Bottom-up Economic Transformation Agenda. Aligning with this development agenda, green hydrogen offers an opportunity to catalyse socio-economic development. The *Green Hydrogen Strategy and Roadmap for Kenya* was launched during the Africa Climate Summit in September 2023. The multi-pronged strategy seeks to leverage the country's abundant renewable energy sources. The broad perspective of the strategy is to stimulate demand for diverse uses of green hydrogen and its derivatives in transport, agriculture, power generation and industry, among others.

Implementation of the strategy is spread over ten years, in two five-year phases:

PHASE I

The first phase (2023-2027) focuses on cultivating domestic demand and implementing catalytic commercial projects to kick-start the green hydrogen industry. The target is to substitute 20% of imported ammonia-based fertilizer (around 100,000 tonnes/year) and 100% of imported methanol (>5,000 tonnes/year) with local production.

PHASE II

The second phase (2028-2032) will prioritise market development and external factors that leverage lessons learnt from the first phase with a focus on regional and global export opportunities. The target is to substitute 50% of imported ammonia-based fertilizer (around 300,000 – 400,000 tonnes/year), decarbonise power generation and the transport sector using green fuels and explore the export market for green hydrogen derivatives.

To herald and coordinate the industry, a Green Hydrogen Program Coordination Committee (GH2-PCC) has been established. GH2-PCC is a multisectoral committee comprising government ministries and state agencies relevant to the green hydrogen economy, private sector and civil society. The committee provides strategic oversight and monitors the implementation of the *Green Hydrogen Strategy and Roadmap for Kenya*.

The GH2-PCC is supported by a Green Hydrogen Secretariat (Secretariat) hosted by the Ministry of Energy and Petroleum. The Secretariat operates as a “one-stop-shop” to streamline project approval, fast-track implementation of flagship projects, and provide market research and value chain analysis. The functions of GH2-PCC and the Secretariat are provided in Appendix I.

These Guidelines, issued by the Energy and Petroleum Regulatory Authority (Authority) in consultation with stakeholders, aim to ease engagements between investors, the GH2-PCC, the Secretariat, and other industry participants to accelerate investment in the sector.

1.2. Purpose

The overall objective of the guidelines is to stimulate a green hydrogen economy in Kenya. The specific objectives are:

- a) To define the sustainability criteria for green hydrogen projects in Kenya;
- b) To catalyse green hydrogen projects in Kenya by streamlining the approval processes;
- c) To promote the production and safe handling of green hydrogen and its derivatives;
- d) To create employment opportunities through the development of a green hydrogen economy;
- e) To promote compliance with the relevant local and international standards, regulations and other best industry practices;



- f) To provide a framework for monitoring the implementation of green hydrogen projects in Kenya; and
- g) To enable capacity building and research and development in green hydrogen and its derivatives in Kenya.

1.3. Scope

These Guidelines apply to developers and users of green hydrogen (and/ or its derivatives).

1.4. Sustainability criteria for green hydrogen

Green hydrogen is produced through a process of electrolysis where water is split into hydrogen and oxygen using electricity derived from renewable energy sources. This results in zero or minimal carbon emissions. In the context of green hydrogen production in Kenya the applicable renewable energy technologies are solar, wind, geothermal, hydro, biomass, tidal and other ocean resources.

Electricity, water and land are finite resources, and hence, the production of green hydrogen should be done sustainably to ensure economic, environmental and social benefits and enhance trust and confidence among the players along the value chain. Adherence to standards ensures compliance in critical areas such as stakeholder engagement, land acquisition, waste management, the rights of local communities, and equitable benefit sharing. This, in turn, bolsters the integrity and reliability of the entire value chain.

The sustainability criteria for electricity from renewable energy, water and land are defined below.

1.4.1. Source of electricity

Electricity for green hydrogen production may be sourced through any of the following three (3) options, or a combination of them.

a. Option 1: Captive renewable energy plant

The renewable energy plant constructed solely for green hydrogen production via an electrolyser can either be off-grid or grid-tied. Where the renewable energy plant is grid-tied, annual net zero energy measurements will be required to verify that only electricity produced by the captive renewable energy plant was used for purposes of electrolysis. The Authority shall validate the energy measurements. Energy attribute certificates and/or renewable energy certificates from a body recognised by the Authority may be used to validate the electricity used for the electrolyser.

b. Option 2: Supply of renewable energy from the Grid

The electricity supply to the electrolyser should be at least 80% renewable energy based on the previous calendar year electricity mix. The grid emission intensity from the Grid should be below

64.8 gCO₂/kWh based on the previous year electricity mix. During conceptualisation of the project, the developer shall demonstrate that the supply of electricity from the Grid shall not compromise the security of supply to other users.

c. Option 3: Power wheeling using the Grid

This is applicable where the operator of the electrolyser owns a renewable energy plant away from the electrolyser site or purchases renewable energy electricity by entering into a power purchase agreement (PPA) with another market player. The electricity is wheeled using the Grid from the renewable energy plant to the electrolyser. In this arrangement:

- The renewable energy plant should not have been contracted for the Grid at the time of commissioning of the electrolyser.
- The electricity used by the electrolyser must be generated in the same period when the renewable energy plant is operational.

The Authority shall validate the energy measurements. Energy attribute certificates and/or renewable energy certificates from a body recognised by the Authority may be used to validate the electricity used for the electrolyser.

1.4.2. Water resource

A developer shall optimise water use and avoid using freshwater in sites with water stress and reduce risks associated with water access. To optimise the water resource the developer shall conduct a water resource assessment to establish the availability, quantity and quality of water. The assessment report shall be made public and shall identify co-benefits for local communities. The co-benefits may include the supply of water for drinking, irrigation and/or water treatment.

1.4.3. Land

The developer shall identify land suitable for the development of green hydrogen projects. The developer is encouraged to use non-arable land, or areas with minimal environmental and ecological impacts.

1.4.4. Local communities

The developer shall engage and seek acceptance of the project by the community. Further, the developer shall endeavour to improve the standard of living of the affected communities and where resettlement is involved, concurrence with the affected persons shall be sought. The dignity, human rights, aspirations, culture, gender and equity principles, lands, knowledge, practices and natural resource-based livelihoods of local communities shall be respected throughout the project cycle.





2 GREEN HYDROGEN USES AND ITS DERIVATIVES

Hydrogen is an energy carrier (a fuel) that can be used to store, move and deliver energy produced from other sources. Green hydrogen is emerging as a solution for decarbonisation of hard-to-abate industries. The green hydrogen value chain is in development in Kenya and multiple players are targeting segments of production, transformation, transportation and usage as detailed in Figure 1.

This section highlights guidelines on the use of renewable energy for green hydrogen production and its transformation into synthetic fuels, green ammonia and other derivatives. The end uses shall include power generation, transport and industrial applications.

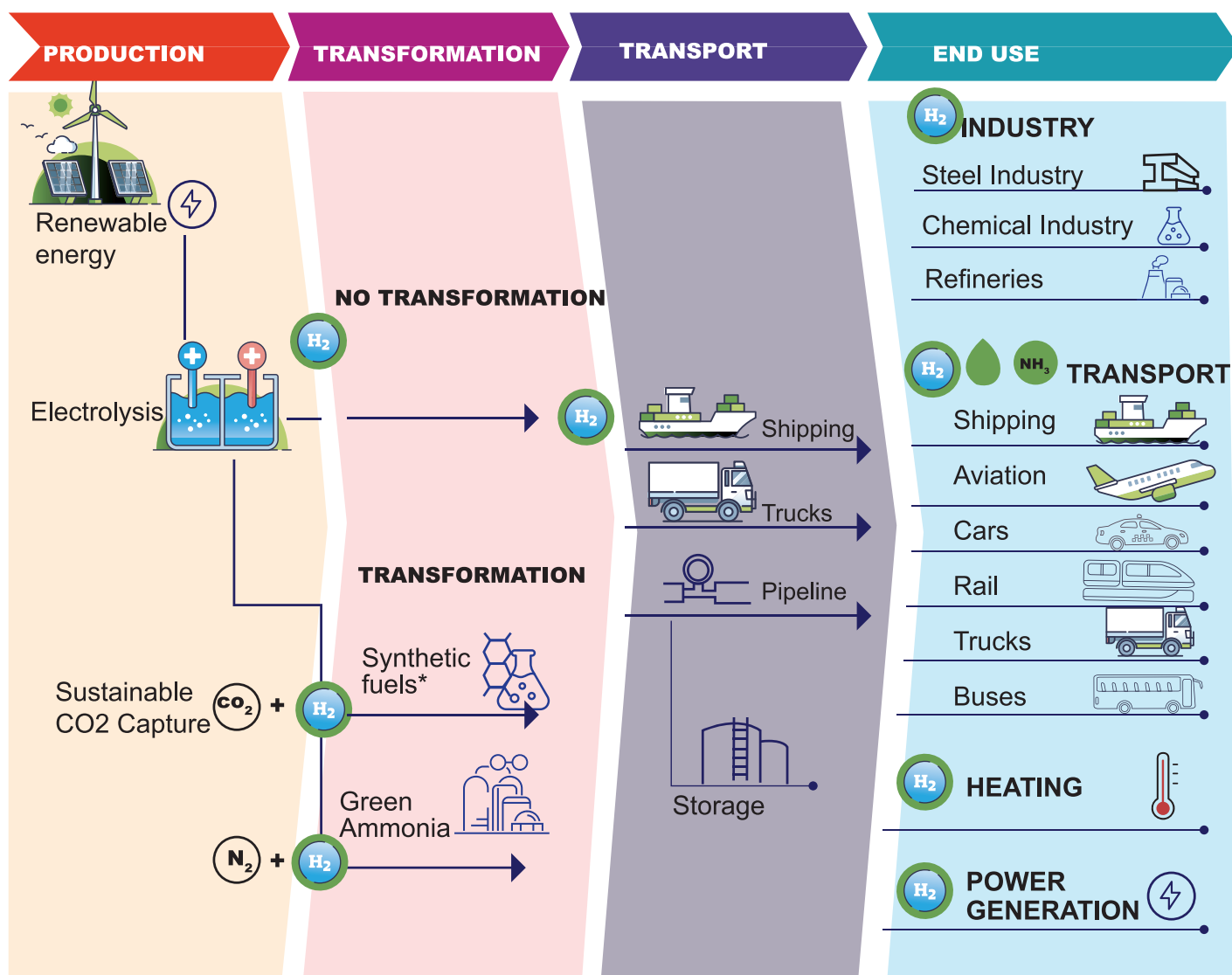


Figure 1: Green hydrogen production, conversion and end uses where CO_2 = Carbon dioxide; H_2 = Hydrogen; NH_3 = Ammonia; N_2 = Nitrogen



2.1. General guidelines on land and water

Land

In Kenya, land is classified as public, community or private each with distinct rules for acquisition and utilisation. The Constitution of Kenya 2010 is the fundamental law governing land ownership, usage and management. The Land Act, 2012 outlines procedures for land administration and management. Under the Act, the ministry responsible for land has the mandate to administer land through surveying, registration, and land-use planning. The specific guidelines on land include:

- 2.1.1 The developer shall identify land suitable for the project and acquire it either through lease or purchase. The developer shall consult the National Land Commission, the ministry responsible for land and/or the relevant county government to verify the legal status of the land, including rightful ownership and confirmation that the land has no legal encumbrances such as liens or disputes.
- 2.1.2 Where the developer intends to use community land, the provisions of Chapter Five of the Constitution and the Community Land Act, 2016 shall apply.
- 2.1.3 A developer who acquires land other than that designated for industrial use shall apply for legal change of use from the Host County Government. Zoning regulations and county spatial plans guide land use, indicating the permissible activities on various land parcels.

Water

- 2.1.4 Article 62 of the Constitution of Kenya classifies water bodies as public land. The Water Act, 2016 is the primary legislation governing water resources. The Water Act establishes a legal framework for use, management, and conservation. County governments play a role in water service provision and have jurisdiction over local water resources. A developer shall acquire a water permit from the Water Resources Authority to extract or use a water resource.

2.2. Green hydrogen

- 2.2.1. Green hydrogen can be used in a fuel cell to generate electric energy for transport or utility power through the reaction between hydrogen (or a hydrogen-rich fuel source) and oxygen. The conversion produces low emissions with heat and water as waste products.
- 2.2.2. Production of green hydrogen requires a supply of renewable energy power that is generated by a captive plant, drawn from the Grid or generated offsite and wheeled through the Grid to

power an electrolyser. This section provides guidance to developers who intend to use any of these options, or a combination of the three detailed in 1.4.1 for electricity supply to an electrolyser for green hydrogen production.

- 2.2.3. A developer who intends to produce green hydrogen shall submit an Expression of Interest (EoI) to the Ministry of Energy and Petroleum in the form set out in Appendix II. The application shall be accompanied by a pre-feasibility study report which shall as a minimum provide details of:
- a) The intended location of the project;
 - b) Size of land required;
 - c) Source of electricity in (MW/MWh) for the electrolyser and renewable energy technology (where applicable);
 - d) Source of water;
 - e) Capacity of the electrolyser in MW to be installed;
 - f) Source of financing for the project;
 - g) Partners to the project;
 - h) Potential infrastructure requirements such as transmission lines, pipeline, railway; and
 - i) Proposed off-taker(s) of the green hydrogen and use (whether own use, domestic or export).
- 2.2.4. The Secretariat shall evaluate EoI applications on a first come, first served basis and provide recommendations to the GH2-PCC. The GH2-PCC shall review the recommendations from the Secretariat and either approve or reject an application.
- 2.2.5. The Ministry of Energy and Petroleum shall communicate the outcome of an application in writing within 60 days of receiving the EoI.
- a) Where the EoI is approved the developer shall progress to conduct a detailed feasibility study within 24 months.
 - b) Where the EoI is declined the reasons for rejection shall be provided.
- 2.2.6. The feasibility study referred to in 2.2.5 shall be submitted to the Ministry of Energy and Petroleum and shall contain, as a minimum, information specified in Table 1.



Table 1: Feasibility study report information

SNO	Detail	Timelines for provision
a	Resource Assessment i. Renewable energy resource assessment and requirement ii. Water resource assessment iii. Land availability and ownership iv. Availability of electricity from the Grid (where applicable)	Within 12 months of approval
b	Technical Feasibility i. Power generation infrastructure and integration with the electrolyser ii. Grid interconnectivity study, where applicable iii. Electrolyser siting, sizing and capacity iv. Wayleave acquisition v. Storage and transport infrastructure. vi. Compliance with applicable emission standards vii. Health and safety compliance	Within 18 months of approval
c	Environmental and social impact assessment in accordance with the Environmental Management and Co-ordination Act, 1999	Within 18 months of approval
d	Project financing and proposed green hydrogen off-taker/transformation	Within 18 months of approval
e	Risk management plan	Within 24 months
f	Implementation plan	Within 24 months

- 2.2.7. The Secretariat shall evaluate the final feasibility study report submitted and provide recommendations to the GH2-PCC. The GH2-PCC shall review the recommendations from the Secretariat and approve or reject it with reasons. The Ministry of Energy and Petroleum shall communicate the outcome of the review in writing within 60 days of receiving the feasibility study report.
- 2.2.8. Where a developer fails to meet the milestones listed in Table 1, the developer shall submit a written explanation to the Ministry of Energy and Petroleum and, where necessary, apply for an extension.
- 2.2.9. A request for extension shall be reviewed by the Secretariat and recommendations submitted to GH2-PCC for approval. Where approval is granted, the extension period shall not exceed 12 months. The application for an extension shall be processed within 60 days.
- 2.2.10. The GH2-PCC may revoke the EoI approval where the developer fails to conduct a feasibility study or where the explanation provided for an extension of timelines is not satisfactory. The site shall be made available to other developers.
- 2.2.11. A developer may voluntarily relinquish a site under development by writing to the Ministry of Energy and Petroleum. Communication relinquishing a site under development shall be accompanied by reasons for exit.
- 2.2.12. A developer whose feasibility study is approved shall be required to obtain further relevant approvals highlighted in Appendix III before implementing the project. The Secretariat shall guide the developer on requirements for the approvals.
- 2.2.13. The installation and operation of green hydrogen infrastructure shall adhere to safety standards and regulations governing the production, storage, and transportation of toxic and highly flammable products. Proper labelling and documentation of green hydrogen during storage and transportation is required. The infrastructure shall be tested regularly for safety in compliance with Kenyan standards and other relevant international standards.
- 2.2.14. Prior to commercial operation of the green hydrogen facility, the developer shall obtain proof of product conformity to applicable standards from the Kenya Bureau of Standards and/or international certification as green hydrogen, where applicable.
- 2.2.15. The green hydrogen production process to be used in Kenya shall have overall well-to-gate lifecycle GHG emissions of less than or equal to 1.0 kgCO₂e/kgH₂. Production intended for export shall meet emissions standards of the off-take market.



Regulatory steps for establishment of operations handling green hydrogen and its derivatives



KENYA GREEN HYDROGEN SECRETARIAT Providing support to investors/developers

- 2.2.16. A developer of a green hydrogen project shall engage relevant stakeholders, obtain approvals highlighted in Appendix III and optimise social acceptance of the project.
- 2.2.17. Storage of green hydrogen in any form shall adhere to and comply with applicable standards and regulations. The storage and transportation facilities shall be well-ventilated, fitted with leak detectors and visibly marked as “Extremely flammable and pressurized gas”.
- 2.2.18. Transportation of green hydrogen may be by pipeline, rail, road tankers, ships or any other method approved by the Authority. Where a road tanker is used, a valid motor vehicle inspection certificate issued by the National Transport and Safety Authority (NTSA) for each prime mover, trailer, tanker truck, and containerised truck shall be maintained. For marine transportation, the transporter shall provide proof of membership of the Oil Spill Mutual Aid Group (OSMAG).

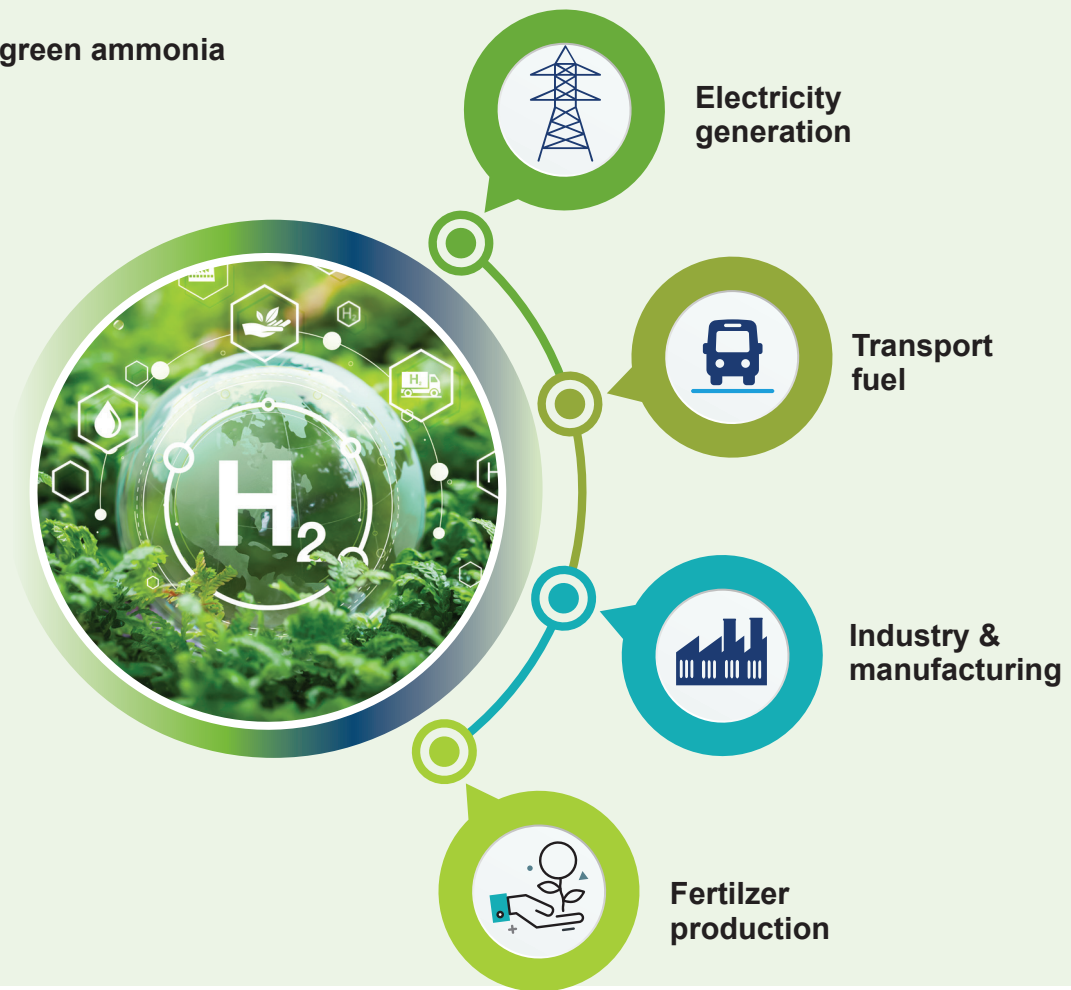
- 2.2.19. A producer of green hydrogen shall maintain a valid calibration certificate issued by the Department of Weights and Measures for measuring instruments, storage tanks and tanks mounted on each trailer as applicable.
- 2.2.20. Operators of green hydrogen infrastructure shall develop and maintain an emergency response plan which shall be approved by the Authority. The operators shall build the staff capacity for emergency response within their organisation. Capacity shall include training for proper handling of flammable and hazardous fuels administered by a National Industrial Training Authority accredited institution or any other internationally recognised organisation.
- 2.2.21. The producer of green hydrogen shall provide the following information to the Authority on an annual basis;
- a) An accounting framework for all the hydrogen produced and its off-takers;
 - b) An annual compliance certificate issued by the National Environmental Management Authority after audits;
 - c) A list of dispensing outlets where applicable; and
 - d) A certificate of product conformity from the Kenya Bureau of Standards.

2.3. Green ammonia

- 2.3.1. Green ammonia is produced from green hydrogen with sustainably sourced nitrogen. The green ammonia production from the process shall be powered using a renewable energy source. Green hydrogen used to produce green ammonia in Kenya shall as a minimum meet the sustainability criteria defined in section 1.4.
- 2.3.2. Green ammonia may be used for electricity generation, as a transport fuel, as an energy carrier and feedstock in fertiliser production and in industrial and manufacturing applications.
- 2.3.3. The green ammonia production process shall have overall well-to-gate lifecycle GHG emissions of less than or equal to 0.3kg CO₂e per kg NH₃ taken as an average over a 12-month period. Production intended for export shall meet emissions standards of the off-take market.
- 2.3.4. A developer of a green ammonia project shall engage relevant stakeholders, obtain approvals highlighted in Appendix III and optimise social acceptance of the project.
- 2.3.5. The infrastructure used for transformation of green hydrogen to green ammonia shall meet applicable standards and guarantee the safety of operators and the environment. A list of standards is provided in Appendix IV as a guide.



Applications of green ammonia



- 2.3.6. Designs and suitability of the material for green ammonia production, storage, transport, metering, handling and dispensing equipment shall be approved by a professional or consulting engineer registered under the Engineers Act, 2011.
- 2.3.7. Prior to commercial operation of the green ammonia facility, the developer shall obtain proof of product conformity to applicable standards from the Kenya Bureau of Standards.
- 2.3.8. Operators of green ammonia infrastructure shall adhere to safety standards and regulations governing the production, storage, and transportation of hazardous products. Proper labelling and documentation of green ammonia during storage and transportation is required.
- 2.3.9. Green ammonia shall be stored in cryogenic tanks or high-pressure cylinders and the developer shall comply with applicable pressure vessel standards and regulations. The storage and transportation facilities shall be well-ventilated and fitted with leak detectors.
- 2.3.10. Transportation of green ammonia may be by pipeline, road tanker, ship or any other method

approved by the Authority. Where a road tanker is used, a valid motor vehicle inspection certificate issued by the National Transport and Safety Authority (NTSA) for each prime mover, trailer, tanker truck, or containerised truck shall be maintained.

- 2.3.11. A producer of green ammonia shall maintain a valid calibration certificate issued by the Department of Weights and Measures for measuring instruments, storage tanks and tanks mounted on each trailer as applicable.
- 2.3.12. Operators of green ammonia infrastructure shall develop and maintain an emergency response plan which shall be approved by the Authority. The operators shall build staff capacity for emergency response within their organisation. Capacity shall include training in the proper handling of flammable and hazardous fuels administered by an accredited National Industrial Training Authority institution or any other internationally recognised organisation.
- 2.3.13. A producer of green ammonia shall provide the following information to the Authority on an annual basis;
 - a) An accounting framework for all the ammonia produced and its off-takers;
 - b) Annual compliance certificate issued by the National Environmental Management Authority;
 - c) A list of dispensing outlets where applicable; and
 - d) A certificate of product conformity from the Kenya Bureau of Standards.

2.4. Synthetic fuels

- 2.4.1. Synthetic fuels are produced from green hydrogen and sustainably sourced carbon dioxide with the process powered using a renewable energy source. Green hydrogen used for the production of synthetic fuels in Kenya shall as a minimum meet the sustainability criteria defined in section 1.4.
- 2.4.2. Synthetic fuels produced from green hydrogen may be used in aviation, shipping, road transport or industry.
- 2.4.3. A developer of a synthetic fuels project shall engage relevant stakeholders, obtain approvals highlighted in Appendix III and optimise social acceptance of the project.
- 2.4.4. Designs and suitability of the material for synthetic fuel production, storage, transport, metering, handling and dispensing equipment shall be approved by a professional or consulting engineer registered under the Engineers Act, 2011.



Applications of synthetic fuels



- 2.4.5. The infrastructure used for transforming green hydrogen to synthetic fuel shall meet applicable standards and guarantee safety of the operators and the environment. A list of standards is provided in Appendix III as a guide.
- 2.4.6. Prior to commercial operation of the synthetic fuel facility, the developer shall obtain proof of product conformity to applicable standards from the Kenya Bureau of Standards.
- 2.4.7. Operators of synthetic fuel infrastructure shall adhere to safety standards and regulations governing the production, storage, and transportation of toxic and highly flammable products. Proper labelling and documentation of green synthetic fuels during storage and transportation is required. The information shall include purity, composition and safety measures to be considered as per the applicable standards.
- 2.4.8. Storage of synthetic fuels in any form shall comply with applicable standards and regulations. The storage and transportation facilities shall be well-ventilated, fitted with leak detectors and visibly marked as “Extremely flammable fuel”.

- 2.4.9. Synthetic fuels may be transported by pipeline, road tanker, ship or any other method approved by the Authority. Where a road tanker is used, a valid motor vehicle inspection certificate issued by the National Transport and Safety Authority for each prime mover, trailer, tanker truck, and containerised truck shall be maintained. For marine transportation the transporter shall be a member of the Oil Spill Mutual Aid Group.
- 2.4.10. A producer of synthetic fuel shall maintain a valid calibration certificate issued by the Department of Weights and Measures for measuring instruments, storage tanks and tanks mounted on each trailer as applicable.
- 2.4.11. Operators of synthetic fuels infrastructure shall develop and maintain an emergency response plan which shall be approved by the Authority. The operators shall build staff capacity for emergency response within their organisation. Capacity shall include training in the proper handling of flammable and hazardous fuels administered by a National Industrial Training Authority accredited institution or any other internationally recognised organisation.
- 2.4.12. A producer of synthetic fuel shall provide the following information to the Authority on an annual basis;
- a) An accounting framework for all the synthetic fuel produced and its off-takers;
 - b) Annual compliance certificate issued by the National Environmental Management Authority;
 - c) A list of dispensing outlets, where applicable; and
 - d) A certificate of product conformity from the Kenya Bureau of Standards.





3 HEALTH, ENVIRONMENTAL AND SAFETY OBLIGATIONS

Developers shall comply with applicable standards and laws on health, safety, and environment.

4 REGISTER OF APPROVED PROJECTS

The Ministry of Energy and Petroleum shall maintain and publish a register of projects approved under these guidelines on its website.

5 LOCAL CONTENT

Projects on green hydrogen and its derivatives shall promote shared benefits for the local community, host county and national government. The benefits may include partnership with Kenyans in project development, research and development, use of locally available knowledge and skills, investment in capacity building and maximising the use of locally available materials and locally manufactured products.

6 INCENTIVES

- 6.1 Kenya is the largest and most advanced economy in East and Central Africa contributing more than 50% of the region's gross domestic product. The country presents a favourable investment environment: Investment in Kenya offers access to a pool of skilled labour, established physical infrastructure, a well-established and vibrant private sector, a liberalised market, and access to regional markets through Kenya's membership in the Africa Free Trade Area, the Common Market for Eastern and Southern Africa and the East African Community.
- 6.2 To promote a green hydrogen economy the government has developed a Green Hydrogen Strategy and Roadmap for Kenya with national targets and long-term goals that investors and development partners can align with.
- 6.3 The Ministry of Energy and Petroleum has established a Secretariat to serve as a one-stop shop for information, guidance and support relating to green hydrogen investments and initiatives in Kenya.
- 6.4 Kenya has established export processing zones (EPZ) where investors in green hydrogen and its derivatives can benefit from multiple incentives including:
- a) A 10-year tax holiday;
 - b) Perpetual exemption on duty and value-added tax (VAT) on machinery and raw materials;
 - c) Operation under a single license;
 - d) Perpetual exemption from stamp duty;



- e) A 10-year withholding tax holiday;
- f) 25% corporate tax after the first 10-year tax holiday expires;
- g) 100% investment deduction allowance over 20 years; and
- h) No exchange controls; Kenya has a liberalised foreign exchange regime.

6.5 The government has established three public special economic zones (SEZ) and has licenced more than fifteen (15) private special economic zones with the following incentives for companies located in them:

- a) Imported goods fully exempt from VAT, excise duty, import duty and import declaration fee;
- b) Zero-rated VAT for local supplies;
- c) 10-year tax holiday;
- d) 10% corporate tax for the first 10 years, 15% corporate tax for the next 10 years and 30% corporate tax for subsequent years;
- e) Operation under a single license;
- f) Perpetual exemption of stamp duty;
- g) Preferential rates for withholding tax at 5% on interest, management and royalties;
- h) 100% investment deduction allowance over 20 years; and
- i) Access to special electricity tariffs.

Investors in green hydrogen and its derivatives may apply for areas where their projects are being developed to be designated as SEZ.

6.6 Kenya has the Public Private Partnership Act of 2021 which provides guidelines on engagement between the public and private sectors.

7 COMMENCEMENT DATE

These guidelines shall come into effect on 1st May 2024.

8 TRANSITION

Where a developer holds an EOI approval at the commencement of these guidelines the EOI shall be assumed to have been granted on the date of commencement of the guidelines. The developer shall be required to update the Secretariat with all the requirements under the EOI within sixty days of commencement and thereafter to submit project milestones to the Secretariat as required by these guidelines.

9 COMPLAINTS AND DISPUTE HANDLING

Any complaint or dispute under these guidelines shall be referred to the Authority for resolution in accordance with the Energy (Complaints and Disputes Resolution) Regulations, 2012.

10 REVIEW

The Authority shall, in consultation with stakeholders, review these guidelines every three years from the date of publication or on a need basis.



APPENDIX I:

ROLE OF THE KENYA GREEN HYDROGEN SECRETARIAT AND THE GREEN HYDROGEN PROGRAM COORDINATION COMMITTEE

Role of the Kenya Green Hydrogen Secretariat (the Secretariat)

The role of the Secretariat is:

- i. Support the GH2-PCC: The Secretariat provides technical, legal/governance, environmental, social and financial/economic advisory services to the GH2-PCC.
- ii. Project tracking: The Secretariat takes stock of all projects and their status and evaluates their relevance in a transparent, uniform and structured way.
- iii. One-stop-shop: The Secretariat serves as a central hub or “one-stop-shop” for information, guidance and support related to green hydrogen projects and initiatives in Kenya.
- iv. Project facilitation: The Secretariat assists in project development by providing guidance on regulatory processes, permits, financing options and other logistical aspects of green hydrogen projects.
- v. Stakeholder coordination: The Secretariat coordinates communication and collaboration among stakeholders involved in the green hydrogen economy helping to streamline efforts and avoid duplication.
- vi. Capacity building: The Secretariat plays a role in capacity building by organising training programs, workshops and knowledge-sharing events related to green hydrogen technology and industry.
- vii. Market development: The Secretariat works to create a favourable market environment for the development of a green hydrogen economy which includes engaging with investors and helping to de-risk projects.
- viii. Policy support: The Secretariat assists in the development and implementation of policies, regulations, standards and certification mechanisms that support the growth of the green hydrogen sector. The Secretariat ensures alignment of standards and certification mechanisms with those at regional and global levels to aid Kenya’s participation in international trade of green hydrogen and its derivatives.
- ix. Information dissemination: The Secretariat disseminates information about green hydrogen opportunities, best practices and developments to stakeholders and the public.
- x. The Secretariat will assume any other assignment(s) incidental to the achievement of the objective.

Role of the Green Hydrogen Program Coordination Committee

The role of the Green Hydrogen Program Coordination Committee (GH2-PCC) is:

- i. Strategic leadership: The GH2-PCC provides strategic leadership and oversight for the development of the green hydrogen industry in Kenya. It sets the overall country vision, mission and project priorities for the development of the green hydrogen economy.
- ii. Policy formulation: GH2-PCC is responsible for formulating policies, regulations, standards and certification mechanisms related to green hydrogen, ensuring that they align with Kenya's national development goals and international commitments.
- iii. Stakeholder engagement: GH2-PCC fosters collaboration among various stakeholders including government agencies, private sector players, research/academic institutions and international partners. This includes organising national and international green hydrogen roundtables, webinars, forums, workshops and other convenings for knowledge-sharing.
- iv. Resource mobilisation and allocation: The GH2-PCC oversees the mobilisation of domestic and foreign resources through various instruments including and not limited to green bonds, grants, climate finance and green fiscal incentives. The GH2-PCC also oversees the allocation of these resources, including funding and human resources to support green hydrogen initiatives and projects.
- v. Human, institutional and infrastructure capacity development: The GH2-PCC formulates joint sectorial strategic plans for existing and future human, institutional and infrastructure capacity needs across the green hydrogen value chain in Kenya. The GH2-PCC gives special attention to the interrelation and cooperation between sectors and to break-through and applied research with the support of national and international partnership programmes.
- vi. Monitoring and evaluation: The GH2-PCC develops a monitoring and evaluation plan to track the progress of green hydrogen projects using monitoring and evaluation tools and ensures accountability and transparency in the implementation of the *Green Hydrogen Strategy and Roadmap for Kenya*.
- vii. International engagement: The committee represents Kenya in international forums and partnerships related to green hydrogen, promoting Kenya's interests and seeking opportunities for cooperation.



APPENDIX II:

EXPRESSION OF INTEREST APPLICATION FORM

Instructions to applicants:

Please complete the Green Hydrogen *Project Expression of Interest Application Form* in full. Where information requested is not relevant or not available, please indicate such or provide relevant alternative information.

PROJECT NAME	
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Project Applicant Contact Information

Full name of applicant	
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Mailing address	
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Physical address if different from mailing address	
--	--

Telephone number	
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Fax number	
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Email address	
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Company website	
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Primary contact person (Name, telephone number, email)	
--	--

Alternate contact person (Name, telephone number, email)	
--	--

Project Applicant Organisation Details

Type of legal entity (e.g., private limited company)	
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Country of registration	
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Date of incorporation/registration	
------------------------------------	--

Incorporation/registration certificate number (Attach certified copies of certificate of incorporation and CR 12 – or its equivalent).	
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Tax registration certificate (attach certified copy of certificate)	
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Description of main or related business activities	
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Description of experience with green hydrogen projects	
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Proposed Project Location

Please enclose a 1:50,000 topographical, Google Earth or other map of the project site in electronic and or print form clearly identifying the intended project boundaries, the preliminary location(s) of the main project infrastructure (if known), the proposed Grid connection point and the proposed power line routing (where applicable).

Site name	
Geographical coordinates of project site boundaries	
Nearest urban centre	
Constituency	
County	
Distance to nearest access road	
Distance to proposed Grid connection point (if using the Grid)	
Classification of the land at the project site (private/ public/ community)	
Current ownership of the land at the project site (leasehold/ freehold)	



Description of the Proposed Project

Energy source (please tick as appropriate)

Wind	Solar	Geothermal	Hydro	Tidal/ Ocean sources	Biomass	Grid

Brief summary of energy resource assessment	
Planned installed capacity (MW)	
Anticipated annual electricity generation (MWh)	
Capacity of electrolyser to be installed (MW)	
Estimated amount of green hydrogen to be produced	
Description of any preliminary environmental or social considerations to be addressed	
Brief summary of water resource assessment results	
Potential infrastructure requirements (transmission line, pipeline, railway etc.)	
Proposed off-take/application of the green hydrogen and its derivatives	

Preliminary Project Economics and Financing

Estimated project development costs to reach feasibility study approval	
Projected project CAPEX	
Source(s) of financing (e.g., grant/ equity/debt) and the percentages	
Evidence of the availability of adequate development and equity funds or explanation as to how the required financing will be obtained	
Overview of any local benefits that are expected to be derived from the project	

Project Development and Implementation Plan

Please provide an outline of the proposed project development and implementation plan with anticipated dates of relevant milestones from the date of EOI approval by the Ministry of Energy and Petroleum.

Full feasibility study	
Land acquisition	
Environmental impact assessment licence	
Grid connection study (if using the Grid)	
Other consents and approvals	
Construction	
Commissioning	

Further Information

The applicant will be required to attach a prefeasibility study. Please provide any further information that may be relevant for the assessment of your EOI application such as, any initial approvals secured by the project applicant, land rights agreements, etc.

Project Applicant Signature

Sign this Project Application Form to confirm that the information provided herein is accurate and to acknowledge that the project applicant has read and understood these Guidelines on Green Hydrogen and Its Derivatives and other relevant policies, laws and regulations for production of green hydrogen and its derivatives

Name of representative of the applicant	
Title of representative	
Signature	
Date and place	



For official use only

Project reference number			
Date of submission of application			
Date of receipt of application			
Application form complete?	Yes	No	
Date of Secretariat review			
Decision of Green Hydrogen Program Coordination Committee	Approve	Reject	Request more info
Date of response to applicant			

APPENDIX III:

SUMMARY OF LICENCES AND APPROVALS

No.	Licence/Approval	Issuing Authority	Statutory Timelines (days)	Applicability and Requirements
1.	Environmental and social impact assessment	National Environment Management Authority	90	Applicable to all developers
2.	Water permit	Water Resources Authority		Required by all developers using water resources
3.	Land registration	Ministry responsible for land		Where there is acquisition or leasing of land
4.	Change of user(For land use)	Host county government	Up to 180	Where there is a change of land use from other uses to industrial application
5.	Physical planning approval	Host county government		Applicable to all developers
6.	Power purchase agreement	Off-taker and Energy and Petroleum Regulatory Authority	60	Where the green hydrogen facility is used for grid stabilisation and storage
7.	Power undertaking licence	Energy and Petroleum Regulatory Authority	60	Where the developer is undertaking generation, transmission or distribution of electricity
8.	Construction permit	National Construction Authority	60	For construction of infrastructure
9.	Special economic zone (SEZ)	Special Economic Zone Authority	30	Where the developer intends to conduct their business in a SEZ or have the area where the project is being developed designated as a SEZ.
10.	Valid motor vehicle inspection certificate	National Transport and Safety Authority	7	For prime mover, trailer, tanker truck, and containerised truck used in the transportation of hydrogen and its derivatives



11.	Valid certificate of registration of workplace	Department of Occupational Safety and Health Services		Required for all end products
12.	Civil aviation safety approval	Kenya Civil Aviation Authority		For tall masts
13.	Product conformity	Kenya Bureau of Standards		Required for all end products
14.	Licensing of fertilizer manufacturing	Fertilizer and Animal Foodstuff Board of Kenya (FABK)		For fertilizer manufacturers

APPENDIX IV:

EXISTING STANDARDS FOR GREEN HYDROGEN AND ITS DERIVATIVES

This appendix highlights the existing standards in Kenya at the time of development of the Guidelines. This list is not exhaustive. Green hydrogen and its derivatives are a nascent industry and developers are expected to follow progress in standards adoption locally and at international level as they develop their projects.

a) **HYDROGEN**

Kenyan standards

The main applicable standards are

KS ISO 14687:2019 – Hydrogen fuel – Product specification.

KS 2340-1:2011: Hydrogen – Specification Part 1: Industrial hydrogen.

KS 2340-2:2011: Hydrogen - Specification - Part 2: High purity hydrogen.

b) **AMMONIA**

KS 2865:2019 Anhydrous ammonia-Storage and handling.

KS 2866:2019 The storage and handling of toxic substances.

KS EAS 911:2019 Fertilizers-Ammonium sulphate (sulphate of ammonia)-Specification.

KS ISO 25475:2016 Fertilizers Determination of Ammoniacal Nitrogen.

KS ISO 15604: 2016 Fertilizers - Determination of different forms of nitrogen in the same sample, containing nitrogen as nitric, ammoniacal, urea and cyanamide nitrogen.

KS ISO 7105:1985 Liquefied anhydrous ammonia for industrial use-Determination of water content-Karl Fischer method.

KS ISO 7103:1982 Liquefied anhydrous ammonia for industrial use-Sampling -Taking a laboratory sample.

KS ISO 17179: 2016 Stationary source emissions - Determination of the mass concentration of ammonia in flue gas - Performance characteristics of automated measuring systems.

KS ISO 21877:2019 Stationary source emissions - Determination of the mass concentration of ammonia - Manual method.



KS ISO 4254-2:1986 Tractors and machinery for agriculture and forestry – Technical means for ensuring safety - Part 2: Anhydrous ammonia applicators.

c) METHANOL

KS 2471:2013 Methanol for industrial use – Specification.

KS 2582-1:2014 Safety of chemical products - Code of practice - Part 1: Safety of methanol.

KS 2838:2021 Denatured technical alcohol for use as cooking and appliance fuel — Specification.

d) FUEL CELLS

KS ISO 21087:2019 Gas analysis - Analytical methods for hydrogen fuel Proton exchange membrane (PEM) fuel cell applications for road vehicles.



