Navigating through the increasing complexity of the regulatory requirements for green fuels

June 2023

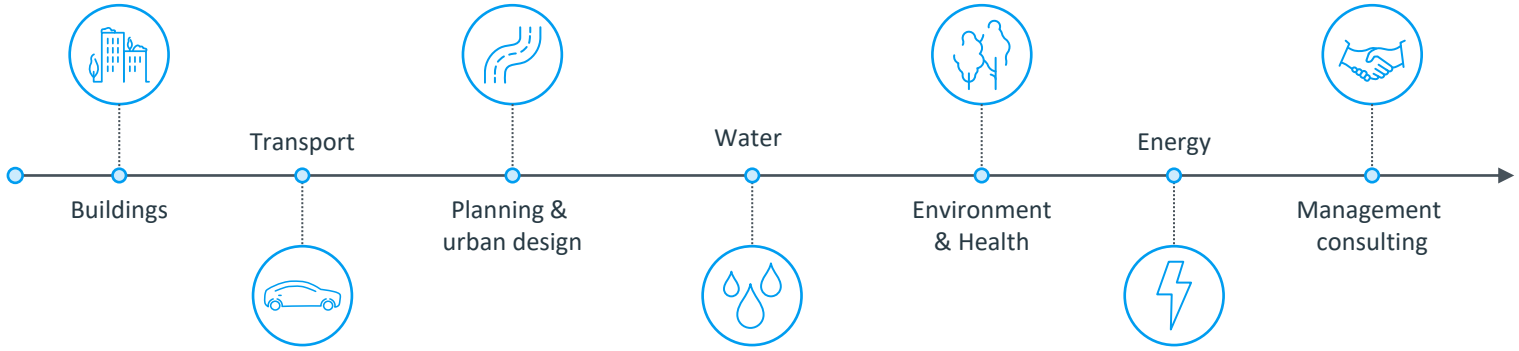
RAMBØLL

Bright ideas.
Sustainable change.

Introduction

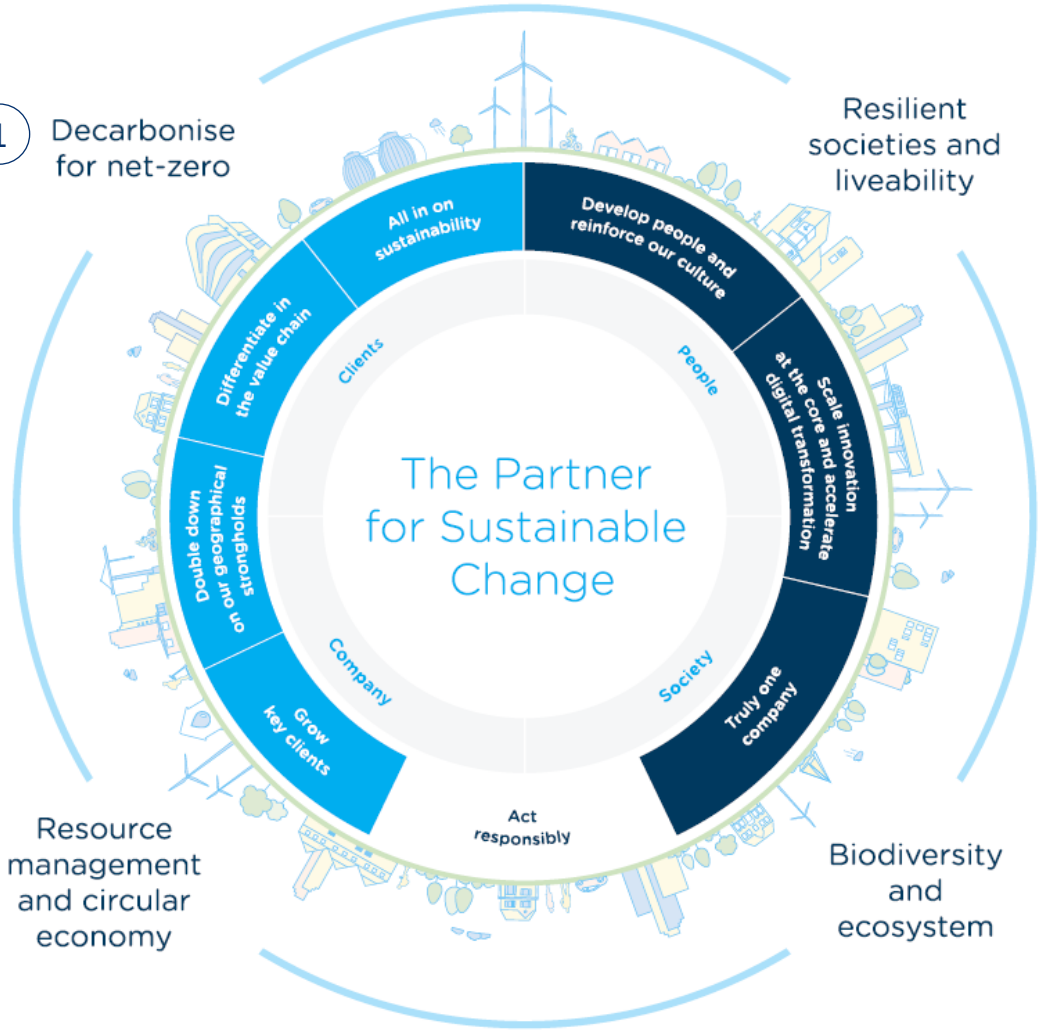
- Independent engineering, architect and consulting company
- Founded in 1945 in Denmark by Børge J. Rambøll and Johan G. Hannemann
- More than 17,000 experts spread across 35 countries
- 14.2 billion DKK turnover
- Owned by the Rambøll Foundation
- Our DNA: Strong positions, high ethical standards, social responsibility and satisfied employees

Our expertise and markets



Supporting the energy transition is at the core of Ramboll's strategic ambitions

Accelerate the Green Energy Transition: Renewables and new technologies



- Ramboll is the trusted partner for our clients, creating value by guiding them successfully through sustainable change, while understanding specific challenges and opportunities
- With an unmatched position in renewables as well as cutting-edge sector and consulting expertise, we aim to be the global leader in the professional services industry in the green energy transition

Ramboll offers a unique mix of technological, commercial and global expertise within green fuels

We know the **technology**

Ramboll is a world-leading advisor within a variety of green fuels and is at the forefront of the development of the technologies used today and in the future.

Our deep technical knowledge of systems and technologies within green fuels underpins our strong position in the market and allows us to help our clients make informed decisions.

Relating knowledge about green fuel technologies to our deep understanding of the green transition and the potential measures (incl. their limitations) makes our recommendations future-fit and highly accurate.

We work across the entire **value chain**

We embrace work across the entire value chain of sustainable fuels production from sourcing of biomass and renewable power, markets, logistics, process and operation, optimisation, to value creation and end-use.

We also work as a trusted technical and strategic advisor for stakeholders along all stages of the value chain, including various governmental bodies and regulators.

Consequently, we know and understand the key stakeholders, and know how to best plan, procure and manage the implementation and operations of alternative fuels[1].

We understand all the **commercial and environmental** aspects

Our technical experts collaborate closely with our experienced management consultants with strong focus and capabilities within green fuels.

We know and understand the waste and energy markets, incl. market trends, drivers, challenges, business models, and prerequisites for operational excellence. We also understand and have insights on the regulatory environment (globally and locally) and how it impacts projects commercially.

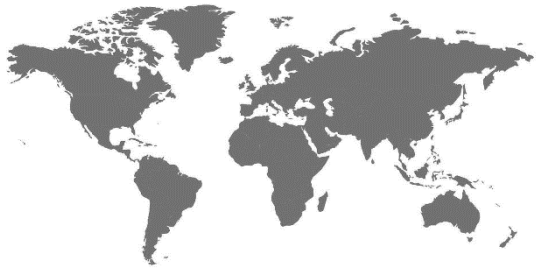
Moreover, our environmental experts support clients with multimedia and multi-agency permitting and compliance support and are well-versed in the various issues unique to renewable fuels.

Our experience is **global**

Ramboll has global expertise combined with in-depth market insights and understanding through our strong local presence.

Our global footprint gives us in-depth "insider" knowledge about market conditions, sector connections and local industry dynamics and practices (incl. business cultural dimensions).

This further strengthens our knowledge-based and industry-specific recommendations, so they suit the unique goals of our clients.



Regulatory requirements to green fuels

Growing demand for sust. fuels results in increasing regulatory complexity

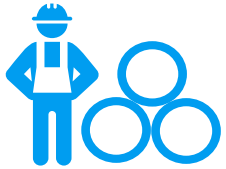
- Demand for sustainable alternative fuels (aka green fuels) is experiencing a strong momentum
- While electrification is a key pathway for decarbonization, it is not always feasible in hard-to-abate sectors, like energy-intensive industry, maritime, and aviation. Green fuels are key here.
- To ensure transparency in the growing market for green fuels, implementing a regulatory framework that safeguards climate benefits is becoming increasingly important, and a high focus for the EU
- Nevertheless to mention, the regulations and underlying requirements are complex, not necessarily aligned across frameworks, and subject to frequent updates
- Whether you are a producer, investor, or market player seeking green fuels like hydrogen or biogas for your transition toward sustainability, it is crucial to acknowledge that you will be subject to diverse regulatory and policy frameworks.

Three EU regulations define mandatory and voluntary requirements to production processes that producers of green fuels must adhere to:

- **RED II** sets renewable energy targets including requirements to production of biofuels. Delegated acts under RED II will define production requirements for e-fuels, ensuring renewable energy and GHG reduction.
- The **EU Taxonomy** aims to enable sustainable investments by defining environmentally sustainable activities. It imposes stricter production requirements for green fuels compared to RED II and the hydrogen and decarbonized gas market package. Investors seek investments aligned with the EU Taxonomy in green fuels.
- The proposed **Hydrogen and Decarbonized Gas Market Package** covers green fuels from non-renewable sources, but sustainability and certification requirements are still pending.

Source:

Who and when will be subject to diverse regulatory and policy frameworks within green fuels?



PRODUCERS

- Producers should prepare to meet the EU's production criteria, such that the fuels can be certified, e.g. under RED II/III and the Proposed Hydrogen and Decarbonised Gas Market Package. While offering regulatory compliance, certificates can also increase the attractiveness of the fuel in the market and open up for green premium.
- Moreover, as the EU and its Member States look to incentivise the production of sustainable alternative fuels, funding and subsidy schemes will be connected to the production of fuels that meet regulatory criteria (RED II/III)

INVESTORS

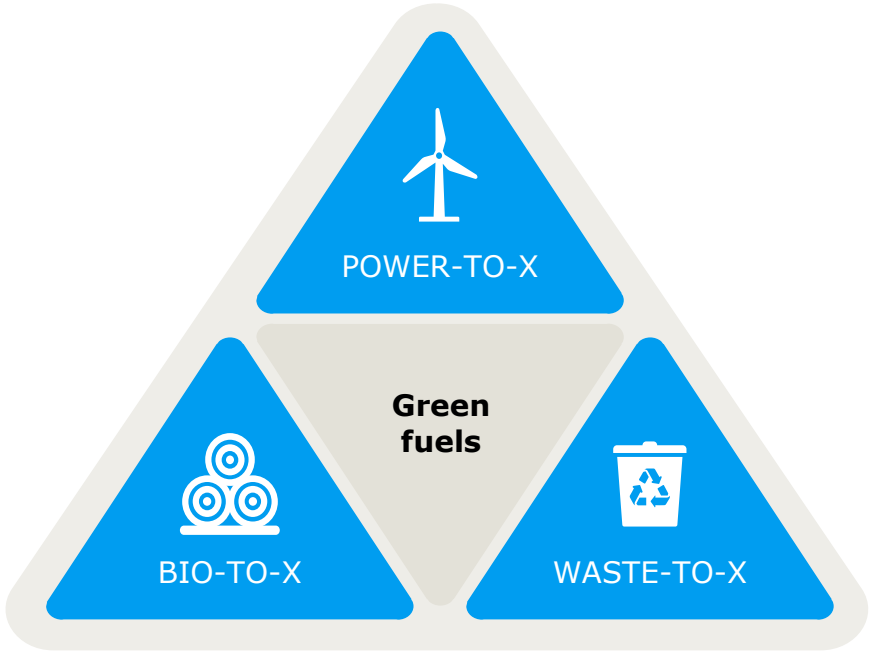
As investors seek to become sustainable and align with various regulatory and policy frameworks (EU Taxonomy, Article 9, etc.), they will seek to invest in activities that meet the criteria of the underlying regulation. That includes projects that comply with production requirements set by the EU.

On the other side, to gain access to funding, producers, therefore, need to ensure the manufacturing of RFNBOs and biofuels is not only RED II, but also are EU Taxonomy aligned.

OFF-TAKERS

To comply with sector specific regulation, off-takers will need to prove green fuels meet the sustainability criteria, i.e. they will need to document certificates that comply with RED II requirements.

Green fuels can be grouped under two categories



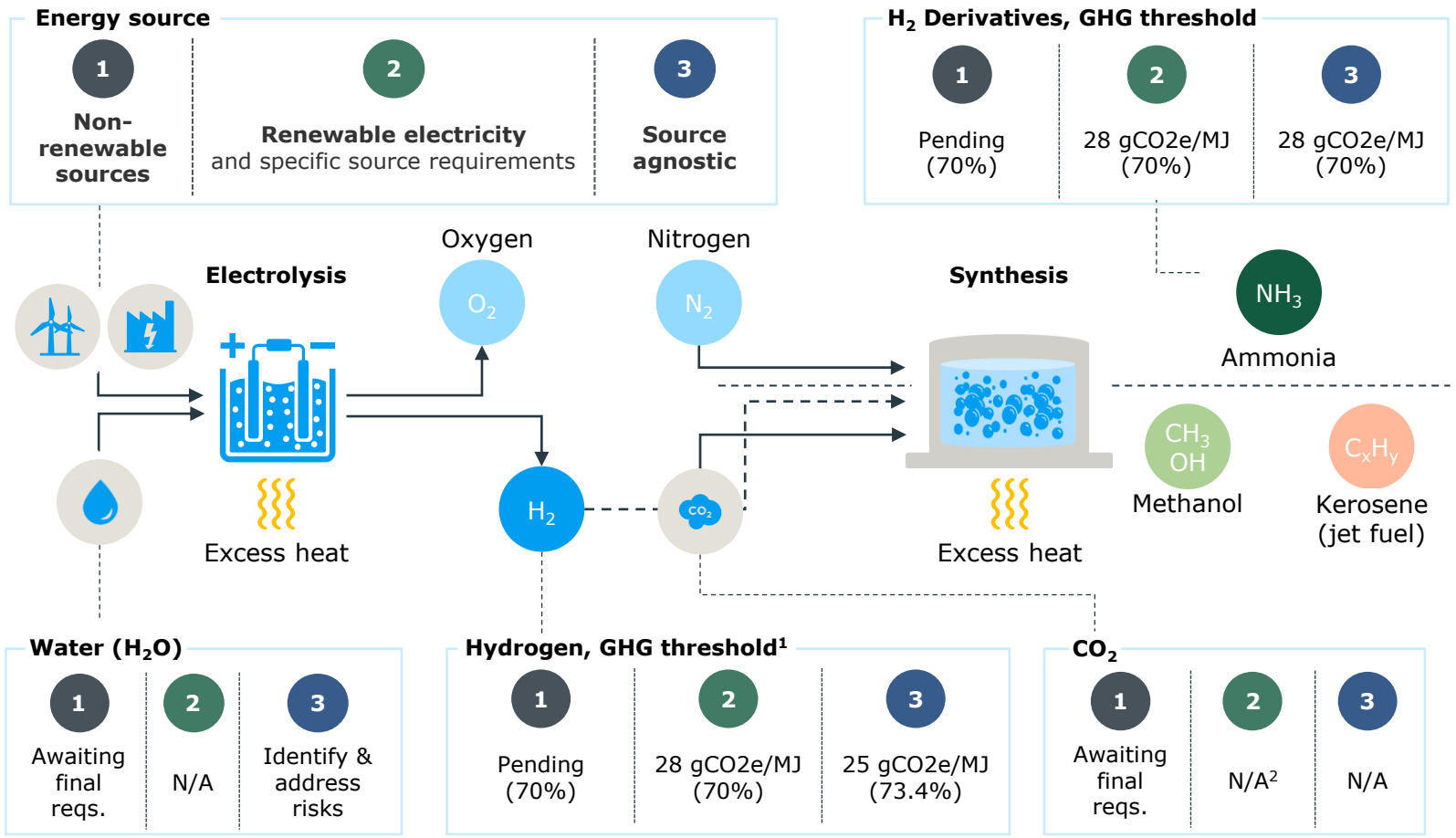
E-fuels are fuels that are produced from renewable or decarbonised electricity. Through electrolysis, water is split into hydrogen and oxygen using electricity. Depending on the desired end-product, nitrogen or carbon dioxide can be added in a synthesis to produce products in either gas or liquid form.

Biofuels are any fuels that are made from biomass – known as the feedstock. The feedstocks are feed into a bioenergy conversion to form biogas from anaerobic digestion, fermentation, gasification or other.

Regulatory requirements to e-fuels

- In the coming years, **e-fuels can be produced in alignment with one of three key pieces of legislation**:

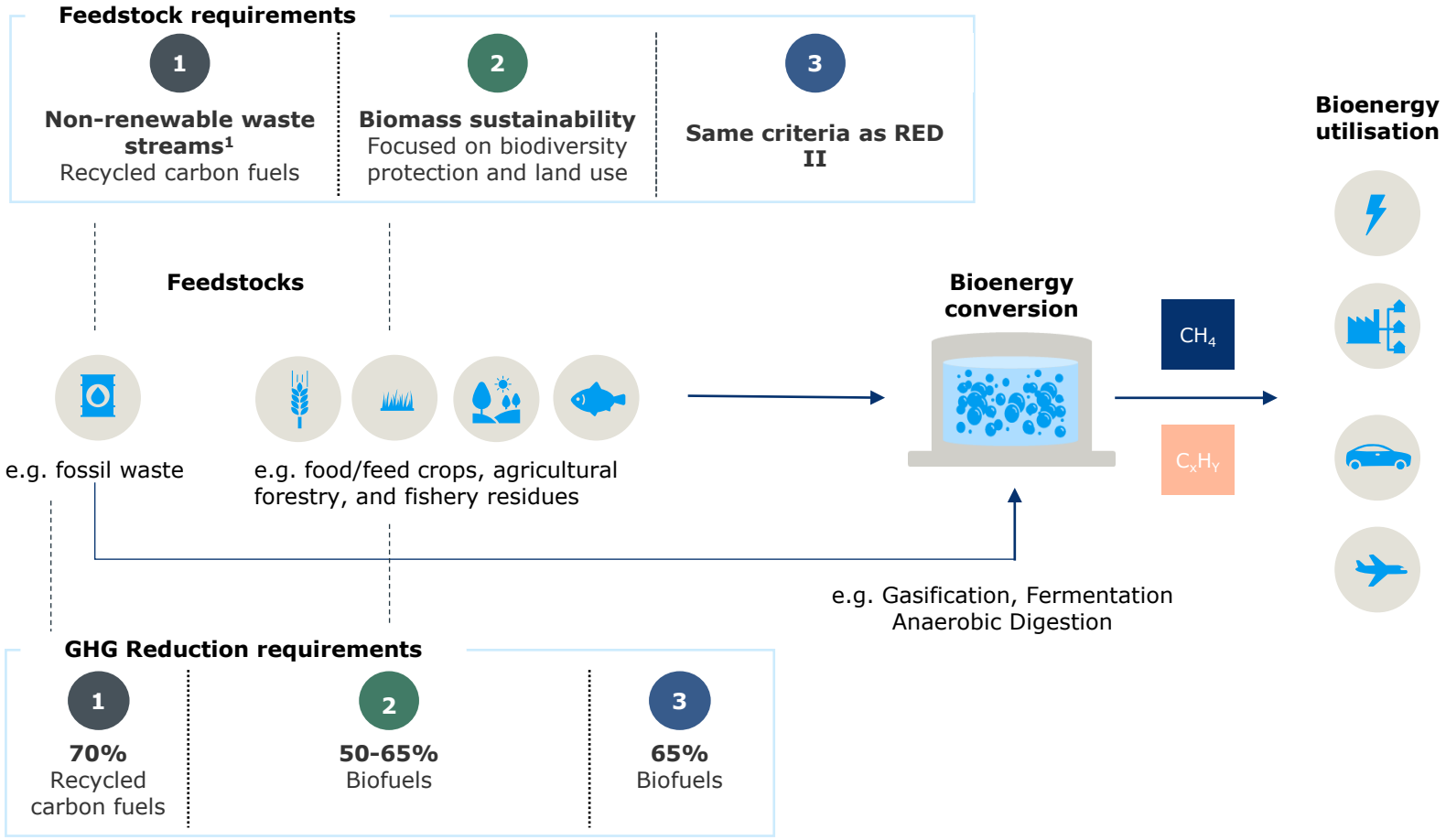
1. **Proposed Hydrogen and Decarbonised Gas Market Package**
2. **Renewable Energy Directive II (RED II)**
3. **EU Taxonomy**



Regulatory requirements to biofuels

- In the coming years, **biofuels can be produced in alignment with one of three key pieces of legislation**:

1. **Proposed Hydrogen and Decarbonised Gas Market Package**
2. **Renewable Energy Directive II (RED II)**
3. **EU Taxonomy**



Renewable Energy Directive updates| High uncertainty exists as final adoption of RED III is pending (exp. 2023)

RED III proposals

	RED II	Commission proposal	Council proposal	Parliament proposal	March 2023 Provisional agreement
Share of energy from renewable sources by 2030	32%	40%	40%	45%	42.5% with 2.5% top-up[2]
Renewable energy in the transport sector by 2030	**14%*** Share of renewables in the transport sector	**13%** GHG reductions & **Min 2.6%** RFNBOs	**13%** GHG reductions or **29%** Share of renewables	**16%** GHG reductions in the transport sector	**14.5%** GHG reductions or **29%** Share of renewables
Specific fuels requirements in the transport sector	**Max 7%** Food crops biofuels & **Min 3.5%** Advanced biofuels	**Max 7%** Food crops biofuels & **Min 2.2%** Advanced biofuels	**Max 7%** Food crops biofuels & **Min 4.4%** Advanced biofuels	**Max 7%** Food crops biofuels & **Min 2.2%** Advanced biofuels	**5.5% from RFNBOs and Advanced biofuels with at least 1% from RFNBOs[3]**
Additionality requirements for e-fuels	Delegated act pending acceptance on:[1] Additionality, geographical, & temporal requirements	Delegated act on: Additionality, geographical, and temporal requirements	Same as commission proposal	Less strict additionality and correlation requirements adopted directly in the directive	No details were published in the initial communication on the agreement
RFNBOs definition	'renewable liquid and gaseous transport fuels of non-biological origin'	'liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass'	Same as commission proposal	Same as commission proposal	No details were published in the initial communication on the agreement

Takeaways and advise

Prepare

Embrace

Stay updated

Bright
ideas.
Sustainable
change.

RAMBØLL