CEMA
European Agricultural Machinery Association

Renewable fuels for agricultural machinery

Why we need a scalable, legally certain and economically viable path to food, energy and strategic security

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KEY MESSAGES

The agricultural machinery sector is committed to contributing to the EU's climate objectives. Due to the operational requirements of agricultural machinery and the long renewal cycles of the fleet, the internal combustion engine – powered by renewable and low-carbon fuels – will remain a key solution for achieving near- and medium-term CO_2 reductions.

A pragmatic, technology-neutral approach combining renewable fuels, efficiency gains, and emerging technologies is essential to deliver climate objectives while safeguarding the competitiveness, resilience, and strategic autonomy of European agriculture.

To ensure a successful energy transition, CEMA calls on EU policymakers to:

- **Respect the economic reality of farmers** and prioritise energy solutions that are scalable, cost-effective, and compatible with existing machinery — particularly sustainable biomass fuels from circular agriculture.
- **Establish a stable and coherent policy framework** for renewable fuels that enables long-term investments (10+ years), with clear rules, aligned EU and national legislation, and credible incentives.
- **Ensure real market uptake of renewable fuels** by removing regulatory bottlenecks, including caps and certification barriers, and by enabling practical implementation of RED provisions (notably for intermediate crops and crop-based biomass fuels).

Farmer reality and systemic challenges

European farmers face multiple structural challenges: climate change, labour shortages, rural infrastructure constraints, energy security, and overall economic viability. Reducing greenhouse gas (GHG) emissions is essential, yet emissions from fuel use in agricultural machinery account for less than 10% of total agricultural emissions, meaning that multiple decarbonisation pathways must be pursued in parallel.

At the same time, farmers operate under tight economic margins, with limited capacity and willingness to absorb additional costs for CO_2 reduction. Any energy transition must therefore be grounded in realistic, economically viable solutions that maintain agricultural productivity, food security, and energy resilience.

Against this backdrop, CEMA members and farmers are already reducing fuel demand through a combination of engine efficiency improvements, optimised drivetrains and hydraulics, precision farming, connectivity, operator assistance systems, and more efficient agricultural practices, logistics, and field operations.

Technology and fleet reality

Agricultural machinery is characterised by long lifecycles and slow fleet renewal rates of approximately 2–4% per year. This means that full fleet transformation takes decades and requires solutions that are compatible with both new and existing equipment.

Electrification is progressing, including through the development of new and innovative types of machinery, but its applicability remains limited for high-power, long-duty-cycle applications typical in agriculture. As a result, the internal combustion engine will remain indispensable in the medium to long term, particularly when paired with renewable and low-carbon fuels.

There is no single technological solution suitable for all farming systems. A diversified mix of energy carriers — including sustainable liquid and gaseous biomass fuels, hydrogen, and potentially e-fuels — will be required. These solutions must reflect regional diversity, farm size, and operational conditions. Farmers will also play a key role as energy producers, contributing through biogas, biomethane, and other on-farm renewable energy systems.

Scalable renewable fuel solutions

Renewable and low-carbon fuels offer immediate and scalable decarbonisation potential, particularly for the existing fleet. Sustainable biomass fuels such as renewable diesel (HVO), biodiesel (FAME), biomethane, and vegetable oils can deliver significant GHG reductions according to the Renewable Energy Directive (RED), while often being compatible with current engines.

To unlock this potential, policy must ensure that feedstock availability and regulatory frameworks enable real deployment:

- Intermediate crops, now recognised under Annex IX of the RED III, must remain effectively eligible through pragmatic implementation rules, flexible definitions at farm level, and certification systems that allow early adoption and investment.
- Artificial constraints, such as the RED Annex IX Part B cap (1.7%), risk limiting the contribution of intermediate crops and should be removed or adapted to reflect their sustainability benefits.
- The current 7% RED cap on crop-based biomass fuels should be removed or at least gradually increased in the next RED update (RED IV), while maintaining strong sustainability safeguards.

Without such adjustments, there is a significant risk that theoretically eligible feedstocks fail to translate into real market uptake, undermining both farmer engagement and investment.

Policy framework and legal certainty

Despite ambitious EU and national renewable energy targets, the current regulatory landscape remains fragmented, with misalignment between EU and national frameworks, unclear metrics, and uncertain timelines. This creates financial uncertainty for both farmers and equipment manufacturers.

In this context and in line with the Accelerate EU initiative to strengthen EU energy resilience, policymakers should ensure a level playing field by setting clear, outcome-based objectives, while preserving the flexibility for farmers and operators to choose the most appropriate technological and energy solutions for their specific operational, economic, and regional conditions. A clear and stable policy framework is essential to support long-term investments in machinery, fuels, and infrastructure. In particular:

- Renewable fuel policies must provide legal clarity and predictability over a horizon of at least 10 years.
- Coherence between the Renewable Energy Directive and other EU initiatives (e.g. ReFuelEU Aviation) is necessary to ensure consistent market signals and enable scale-up across sectors.
- Certification systems must be pragmatic, timely, and aligned with real farming practices, avoiding unnecessary administrative burdens.

Economics, competitiveness and strategic autonomy

The competitiveness of European farmers is the decisive factor for both food security and energy security. Renewable fuels are currently more expensive than fossil diesel, and without adequate incentives, their uptake will remain limited.

At the same time, scaling up domestic production of sustainable biomass fuels and other renewable energy carriers in agriculture contributes not only to sectoral resilience but also to enhanced geopolitical independence. By reducing reliance on imported fossil fuels and strengthening local and regional energy value chains, agriculture can play a strategic role in reinforcing Europe's autonomy in an increasingly uncertain global context.

In addition, expanding sustainable biomass fuel production within the EU will create new income streams for farmers, including through circular economy models.

To enable a viable energy transition:

- Fuel taxation as defined through the Energy Taxation Directive should reflect climate performance, making sustainable fuels more competitive. Moreover, reasonable tax harmonisation between EU Member States would support a level playing field for European farmers.

- Stable and credible incentive schemes must support production, distribution, and on-farm use of renewable fuels and production of sustainable feedstocks — including through the EU Common Agricultural Policy framework.
- Investment support programmes should facilitate access to appropriate technologies and infrastructure, tailored to the diversity of agricultural operations.
- The combination of incentives and taxation for GHG reduction should be designed as a cost-neutral framework to prevent placing additional economic burden on European farmers.

Conclusions

Due to the operational requirements of agricultural machinery and the long renewal cycles of the fleet, the internal combustion engine — powered by renewable and low-carbon fuels — will remain a key solution for achieving near- and medium-term CO_2 reductions.

Beyond emissions reduction, this pathway strengthens agricultural resilience, safeguards food security, supports energy security, and contributes to Europe's geopolitical independence by reducing reliance on imported fossil energy.

Yet this potential remains constrained by regulatory barriers, including caps and certification requirements preventing eligible fuels and feedstocks from reaching the market, as well as a lack of long-term legal certainty, and economic conditions that make renewable fuels uncompetitive without adequate incentives.

To ensure a successful energy transition, CEMA calls on EU policymakers to respect the economic reality of farmers, establish a stable and coherent policy framework for renewable fuels, and ensure real market uptake by removing the regulatory and economic barriers that currently stand in the way.

A pragmatic, technology-neutral approach — combining renewable fuels, efficiency gains, and emerging technologies — is essential to deliver climate objectives while safeguarding the competitiveness, resilience, and strategic autonomy of European agriculture.

The decisions being made now will shape the availability and affordability of renewable fuels for the next two decades. CEMA and its members stand ready to contribute to that process.

ABOUT CEMA

CEMA represents the European agricultural machinery industry, comprising around 1,300 manufacturers, including global leaders and SMEs, with an annual turnover of approximately €40 billion and around 150,000 direct employees. The sector is committed to contributing to the EU's climate objectives, while ensuring the economic viability of farmers and the competitiveness of European agriculture.