

Alternative Fuels for Agricultural Machinery

Main results / outcomes

Electrification with batteries and fuel cells seems as a logical step forward for AG machinery, however issues of weight, energy density, and fast refueling of energy storage on-board for a effective and efficient operating range must be considered. Therefore, full electrification seems feasible for small-sized agricultural machines, while for mid- and large-sized and for high power applications there is no alternative to internal combustion engine.

Practical recommendations

- Renewable and low-carbon fuels (biomass fuels, hydrogen, and e-fuels) are becoming increasingly important.
- Combustion engines will remain essential for agricultural machinery in the short, mid, and long-term due to their specific usage requirements.
- Agriculture should be acknowledged as a key sector for the utilization of e-fuels and Hydrotreated Vegetable Oil (HVO) as drop-in replacement fuels.
- Biomass fuels offer co-benefits such as serving as organic fertilizer and alternative protein sources.
- Biomethane contributes to a circular economy model for the livestock sector and addresses the issue of ammonia/methane emission



1. Methane combustion engine



2. Tractor fueling from Livestock Fugitive Methane

Further information

GHG emissions from burning fossil fuel in AG machinery counts for 10% of total AG emissions or ca. 1% of total EU-27 GHG emissions (https://di.unfccc.int/detailed_data_by_party).

About this abstract

Authors: (Gilles Mayer, New Holland; Ivo Hostens, CEMA aisbl; Vanja Biševac, CEMA aisbl)

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AgroFossilFree is a H2020 multi-actor project that will evaluate the current status in EU agriculture regarding energy use and assess existing needs, allowing farmers to optimize agricultural production through more efficient energy use and reduced GHG emissions, resulting in economic, agronomic and environmental benefits. AgroFossilFree will create a framework under which critical stakeholders will cooperate to evaluate and promote the currently available Fossil-Energy-Free Technologies and Strategies (FEFTS) in EU agriculture. The project is running from October 2020 to September 2023.

Website: www.agrofossilfree.eu

