RES4LIVE
ENERGY SMART LIVESTOCK FARMING
TOWARDS ZERO FOSSIL FUEL CONSUMPTION

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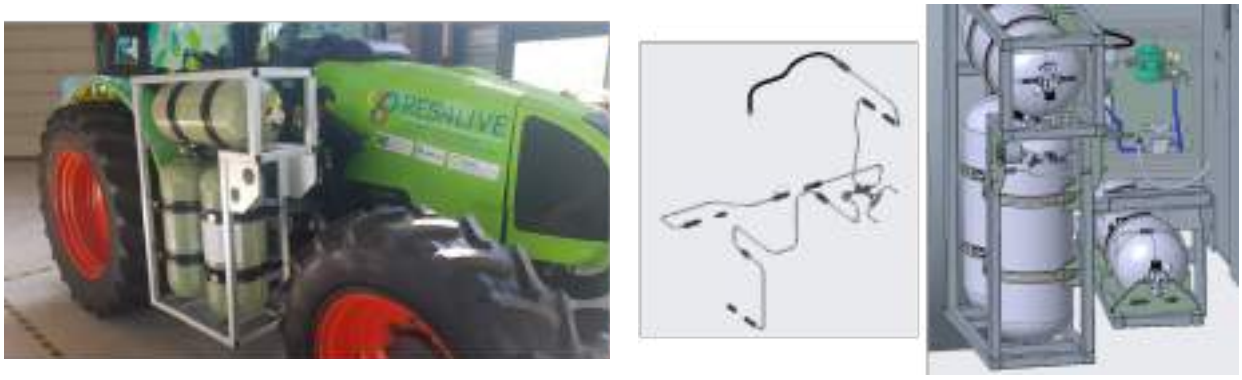
AGRICULTURE & INNOVATION

Adaption of a diesel farm tractor for biomethane use

As part of RES4LIVE, a diesel farm tractor was retrofitted to use biomethane as a compressed natural gas (CNG) and thus completely replacing a fossil fuel source with a renewable fuel source. The conversion process consisted of replacing the fuel tank with a high-pressure storage system for biomethane, changing the combustion by removing the diesel pump and injectors to replace them by spark plugs, ignition coils, and gas injectors controlled by an electronic unit (ECU). In addition, the cylinder head and the pistons needed to be machined, and the turbocharger had to be checked to operate well with the new setup. The feasibility of the retrofit for older tractors depends on the expected remaining life time, which should be at least 15 years. An adequate setup of the converted engine will keep the previous power level and improve exhaust emissions depending on the previous engine stage, although not as to reach the latest standard (EU 2016/1628 Stage V). The operation of the converted tractor requires access to CNG, which could be provided on-farm if a biogas plant along with a biomethane upgrade plant and filling station is available, or from a nearby CNG filling station. For maintenance technical staff that is trained to work with gas-operated vehicles or machines is required.



Gas tanks on the tractor and gas pressure regulation system

Modified cylinder head and spark plug position

The tractor before the conversion (left) and after the conversion next to the CNG upgrade and filling station (right)

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