



Electric tractors (e-tractors) for on farm use

Agricultural machinery is almost universally powered by diesel fueled internal combustion engines, however, several farm machinery manufacturers have conducted research on their electrification and have showcased their electric tractor prototypes at various exhibitions. Conventionally sized field work tractors with battery electric drives offer: (a) reduced emissions, (b) increased driveline efficiency, (c) torque reserve, (d) lower fuel import dependency, (e) increased controllability and (f) use of renewable energy.

Electric tractors can be either converted from conventional tractors, applying the appropriate modifications, or designed and manufactured from the beginning as electric vehicles. Currently the most applied concept for converting tractors is the replacement of the internal combustion engine with an electric drivetrain, without affecting the vehicle's structure. Electric vehicles are classified into Battery

Electric Vehicles (BEV) and Hybrid Electric Vehicles (HEV). HEVs use both an internal combustion engine and an electric motor and one of them acts as the primary power source.

As current energy storage capacity of batteries is generally low to support several hours of heavy work, using an e-tractor would lead to a trade-off between either a

longer working day for the driver due to the recharge time and reduced working time in the farm in total. At the moment two ways to overcome these limitations are autonomous drive systems and rapid recharging systems. Autonomous drive could allow the operation for more hours compared to a manned tractor, while rapid recharging could minimize the recharging time.

RES4LIVE aims to demonstrate and assess the use of an e-tractor for on-farm daily tasks in one of its pilot farms.

