

Changing Horizons: Renewable Energy for a "Fossil-Fuel-Free Farming" - Vision 2025/2050

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In the past, 50 years back, 20% of arable land was used to grow feedstuffs for draught animals such as horses, oxen or water buffalo to provide energy on the farm. This part was set free for other purposes by using external fossil-energy resources. It is time now, to replace this fact by developing and implementing **fossil-energy-free** agricultural production systems.

A puzzle of examples will be presented in order to show, that a **fossil-energy-free agriculture** and **bioeconomy / industrial ecology** will be possible between **2025** and **2050**.

Finally, a **Bio-Vision: "Fossil-Fuel Free Farming in 2025 – 2050"** will be presented focusing on:

- **Fossil-fuel-free** biomass production
- **Fossil-fuel-free** fertilization of crops by seed improvements
- **Fossil-fuel-free** crop protection
- **Fossil-fuel-free** irrigation (solar energy)
- **Fossil-fuel free** mechanical agricultural production systems (New Holland NH₂-tractor, Styr biogas tractor, Deutz-Fahr Agrotion biodiesel tractor, robots, no-tillage)
- **Fossil-fuel-free** smart farming (GPS, Deuterium, drones, Apps)
- **Fossil-fuel-free** new added value chains on farms (decentralized, fully integrated hybrid systems, aquaponic, aeroponic)
- **Fossil-fuel-free** cross functional functions on farms and biorefineries (biogas, biodiesel, bioethanol, solar, wind, water)
- **Fossil-fuel-free** transportation systems
- **Fossil-fuel-free** food/goods processing
- **Fossil-fuel-free** supermarkets/distribution centers/outlets
- **Fossil-fuel-free** cooking
- **Fossil-fuel-free bioeconomy/industrial ecology**

Future Fossil-Fuel-Free Farming for Food, Feed, Fitness, Fuel, Fiber, Flowers, Fresh-water, Fishery, Forestry, Flora, Fauna, Fun, Fortune, and Freedom is one milestone on a road map for tackling the challenges of the 21st century.

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