



# A Solar Solution to Food & Energy Insecurity



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Renewables Forum 21st February 2024  
Scotland Malawi Partnership

# Opportunity Statement:

## AfTrak

- **3.1m** smallholder farming families in Malawi
- Almost exclusively using basic **hand tools**.
- Many do not make **subsistence**.

HOWEVER:

- Agriculture represents more than **31% of the GDP** in Malawi.
- Contributes more than **90% of export earnings**.
- Supports **85% of the total** population living in rural areas.



# ENERGY WITH AGRICULTURE:

## AfTrak The Solution!

- Aftrak is a **solar microgrid** capable of generating **70kWh** per day and supplying an entire village.
- It is supported by **micro electric tractors** powered by the array.
- These tractors enable **Deep Bed Farming (DBF)** for all.
- DBF massively **increases revenue**
- Increased revenue allows revenue generation from **energy sales**.

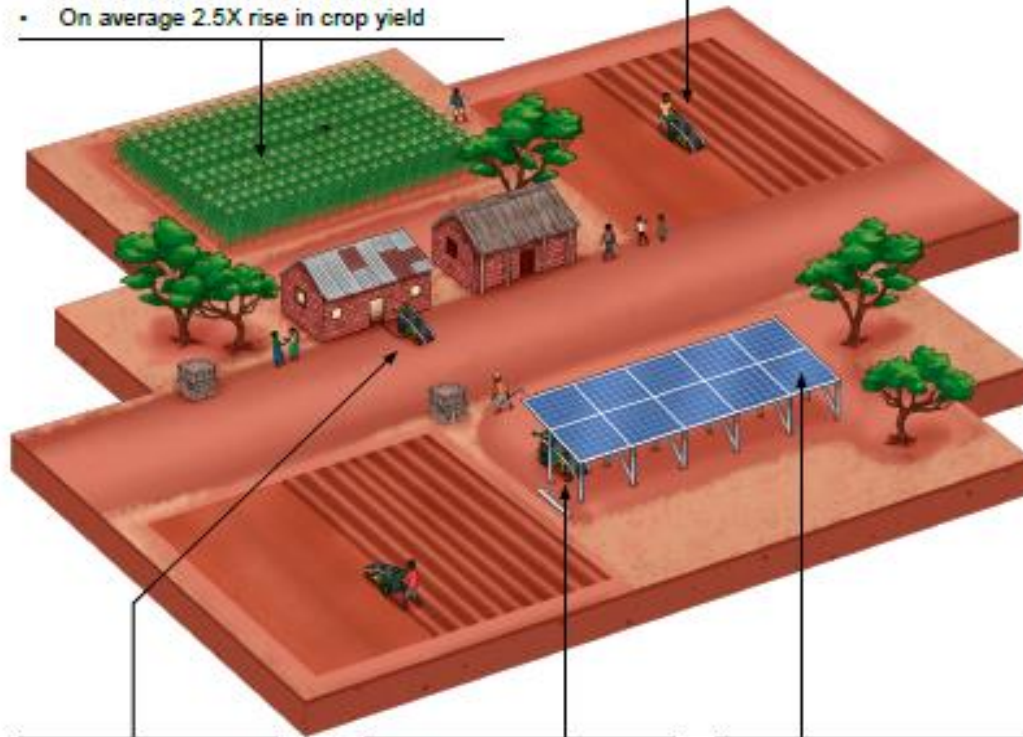


### Deep Bed Farming (DBF)

- Revolutionary Agricultural practice
- Government approved in Malawi
- Increases annual revenue up to 12 times
- Families using Deep Bed Farming consume an extra meal per day
- On average 2.5X rise in crop yield

### Aftrak Electric Tractor

- No fuel costs
- Self powered-can be operated by anyone
- Enables access to DBF



### Aftrak Electric Tractor

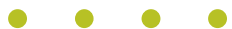
- Works as an energy vector providing power to unconnected homes

### Battery System

- Lead acid batteries
- Temperature stable for Africa
- Fully recyclable - circular economy

### 15kW Solar Array

- Generates 75kWh daily
- Provides a communal shaded space
- Provides an Aftrak Charging Station
- Provides green energy for: Lighting, Cooking, Phone charging, Grain milling etc





# ENERGY WITH AGRICULTURE:

## AfTrak

### The Tractor:

- **Solar Battery** Powered
- Prepares **earth to 400mm** Depth
- Works as an Energy Vector with **AC power** and **USB** charging
- Self-propelling – usable by **anyone**.



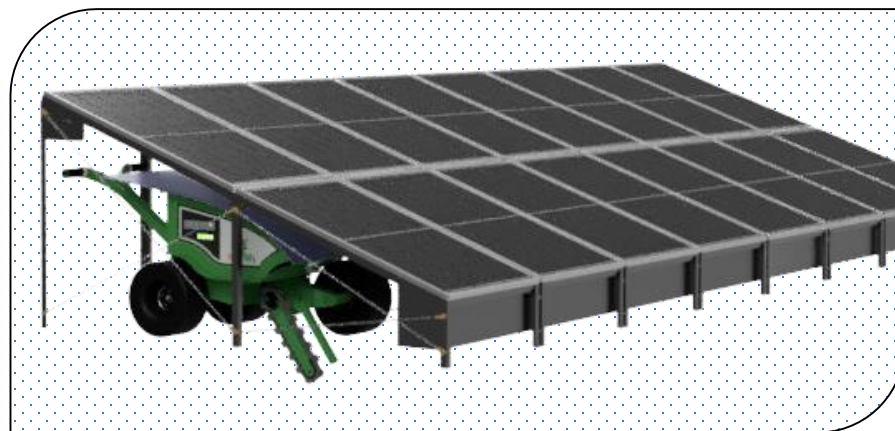


# ENERGY WITH AGRICULTURE:

## AfTrak

### The Microgrid:

- **Modular** 1kW units
- Integrated **Battery**
- Produces **70kWh / day**
- Provides hardwired power to **homes**
- **Charges** Aftrak Tractors.





# ENERGY WITH AGRICULTURE:

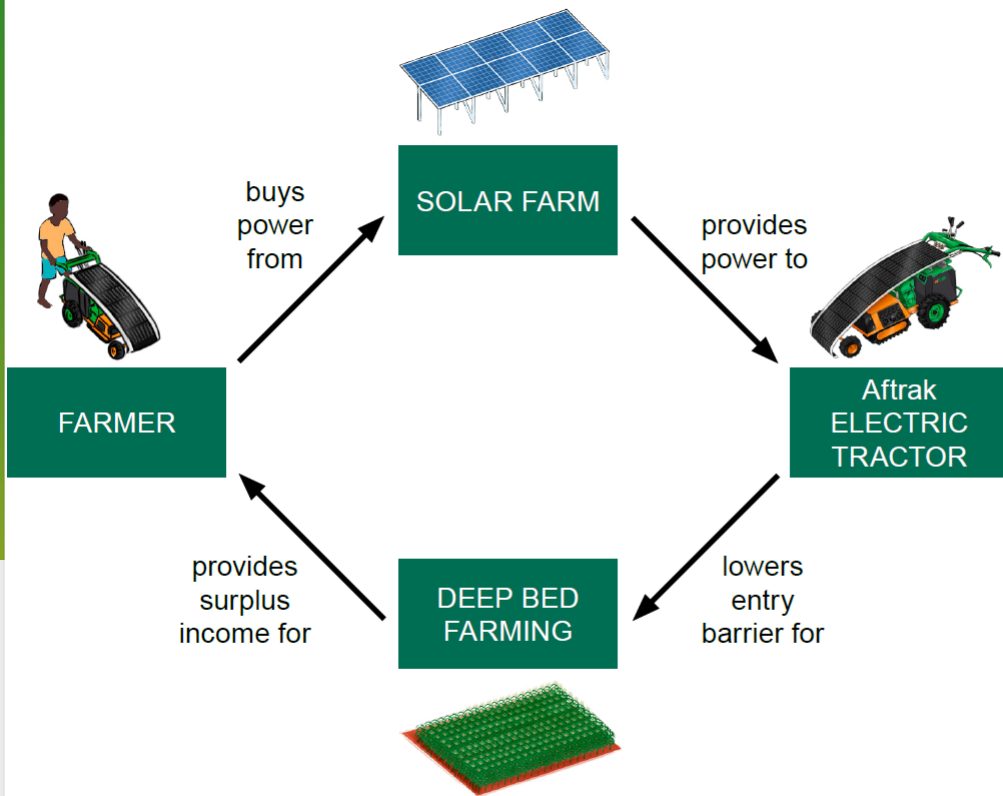
## AfTrak

### Deep Bed Farming:

- **30,000** Farmers Already Onboard!
  - **50%** are women.
- **Approved technique** preparing earth deep enough for crops to flourish.
- **3-fold** increase in yield
- **12-fold** increase in farmer profit.
- Excess profit used to support Microgrid.



**Concept:**  
Micro electric tractor  
Microgrid  
Deep Bed Farming



# ENERGY WITH AGRICULTURE:

## AfTrak

### Market:

- **3.1m** smallholder farming families in Malawi
- **8.9%** of population is grid connected
- **89%** of Malawians are without electricity
- Over **30,000** farmers already practising DBF
- DBF doubles crops yields and harvests water
- Model is applicable across Africa

### Customers:

- **100k** Solar Microgrids needed in Malawi
- **100-300k** Supporting Aftrak Micro tractors

### Different revenue models:

- Farmer owned
- Farmer leased
- Solar revenue supported

# Tiyeni



Loughborough  
University



CONSORTIUM FOR  
BATTERY  
INNOVATION



## ENERGY WITH AGRICULTURE: AfTrak



### Three KEY partners to deliver Aftrak:

**Tiyeni:** Operate in Malawi with an extensive network of champions and farmers deploying Deep Bed Farming.

**Loughborough University:** Centre for renewable energy system technology is highly experienced in solar and Agri technology development and development.

**Consortium for Battery Innovation:** Manages a worldwide network of battery and technology manufacturing partners.