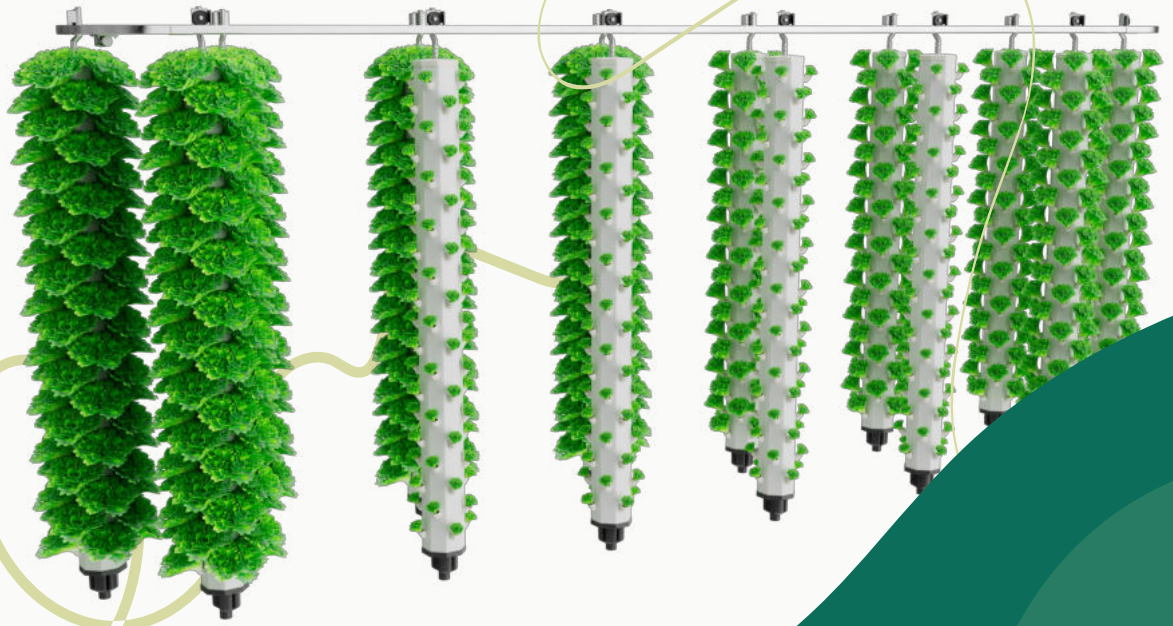
FrugalTec

FARMING-Solutions

«Go Vertical ⬆️ – that's the maximum»



Invention's Documentation
April 2025

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VISION 🌍

We are setting new standards for the agriculture of the future by developing sustainable and innovative solutions that make fresh and healthy food accessible to everyone –

making a significant contribution to the agriculture of tomorrow.

MISSION 🚀

By combining proven technologies with frugal innovation, we develop novel solutions for vertical farming.

Our innovative tower system enables resource-efficient, space-saving, and economically attractive food production –

for greenhouses, urban spaces, and beyond.

THE CHALLENGES

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Intensive land use leaves its mark and climate conditions make cultivation more difficult

Climate Conditions

- Extreme weather
- Crop failures
- Changes in seasons
- Increase in pest & diseases

Transport & Emissions

- Long-distance transportation
- Refrigerated transport
- Cold storage warehousing
- Inefficient routes
- Empty or underfilled trucks

Overuse of Resources

- Over-irrigation
- Over-farming
- Loss of biodiversity
- Soil erosion

Labor Shortage

- Fewer workers – higher costs
- More expensive operations
- Decreased productivity
- Immigration restrictions
- Pressure on automation

THE STARTING POINT

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Agriculture is facing challenges – open-field cultivation suffers from climate change, greenhouses lack automation, and vertical farming is too costly.

Open-field cultivation

Open-field cultivation faces major challenges:

Climate change and extreme weather events lead to unpredictable crop failures, while water scarcity and soil erosion threaten long-term productivity. Additionally, limited arable land, rising production costs, and fluctuating market prices increase the economic pressure on farmers.

Greenhouses

Greenhouses are reaching their limits:

A significant amount of valuable space remains unused, as cultivation typically takes place on a single level. At the same time, manual plant care requires extensive labor, while workforce shortages further complicate production.

Vertical Farming

Vertical farms struggle with high operating costs:

Pure indoor cultivation relies entirely on artificial lighting and climate control, making high energy consumption a major challenge. As a result, they are unprofitable in many regions.

MARKET DRIVERS

Vertical Tower-Farming in greenhouses increases production output while using natural resources efficiently

The industrial Greenhouse sector is experiencing significant growth, driven by several key factors;

Increasing global demand for fresh, high-quality, and locally grown produce is pushing the industry toward more efficient and sustainable cultivation methods.

With **climate change** causing unpredictable weather conditions, controlled-environment agriculture (CEA) in greenhouses ensures stable yields and consistent quality, reducing dependency on traditional open-field farming.

The need to optimize land use is growing, as available **farmland becomes scarcer**. Greenhouses, especially when combined with vertical farming technologies, maximize production per square meter, making them an attractive solution for modern agriculture.

Water scarcity and sustainability concerns are accelerating the adoption of resource-efficient growing systems as greenhouses allow for significantly lower water and fertilizer consumption compared to field farming.

Forecast for High-Tec Greenhouses

2023
60’000 ha

→

2030
> 100’000 ha

Sample image

THE USP – OUR TOWER-SYSTEM

We clearly stand out from the competition with a highly flexible and adaptable system

No other system on the market can be tailored as individually to specific needs. This allows us to cover a wide range of different applications using the same components.
Unmatched by competitors.

USP

Our Tower System offers maximum flexibility and can be individually adapted to the needs and conditions of our customers – both in terms of systems height and plant spacing.

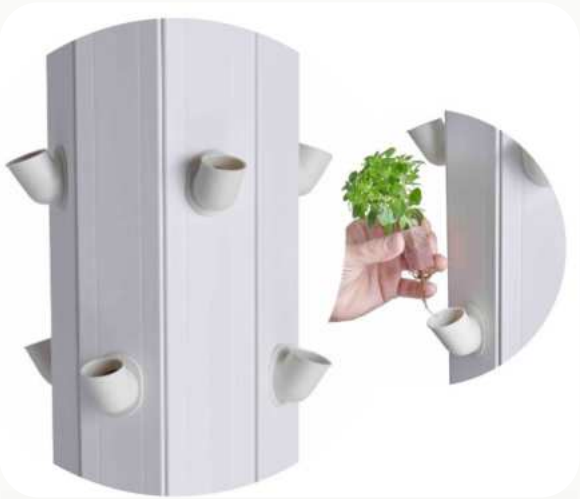
No system on the market currently exists as a hanging and rotating tower version, nor does any other system allow for vertical cultivation in greenhouse while enabling horizontal operation.

The mobile approach unlocks additional potential, including localized irrigation, designated loading and unloading areas, easy plant inspection and monitoring, as well as targeted pest control. This solution also enables a low-cost automation approach.

- Innovative Tower system
- Modular and scalable
- Low-cost automation possible
- Rotating
- Hanging
- Horizontal and vertical
- Insulating
- Small and large

THE INVENTION

From individual panels – to an innovative tower system with the highest flexibility



Individual panels

Our system is based on the concept of eight individual panels that together form a tower in the shape of an octagon.

The panels can be easily removed and form a tight seal when assembled.

This enables vertical cultivation while planting and harvesting take place horizontally.

Individual plants

The individual plant inserts can be easily removed and reattached. They feature a sealing geometry that ensures a tight fit with the panel.

This solution allows for high-density cultivation of young plants in vertical tower systems, with the flexibility to later rearrange them into different configurations.

Variable length

The panels and the supporting structure of the tower are produced through an extrusion process, allowing for easy adjustment to any desired length.

The plant holder holes are milled afterward, making it possible to set any spacing as needed. This ensures maximum flexibility for various requirements.

THE INNOVATION

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The future lies in the combination of existing, innovative systems that optimize space while working more efficiently trough automation.

NFT-Systems

Only one single level that enables dense cultivation but does not utilize the space (height) in the greenhouse.

16 plants
per m2

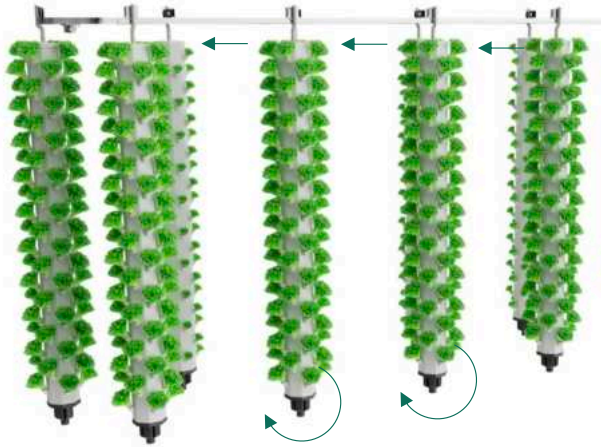
Today

Tower-Systems

Today's systems are very rigid, neither rotating nor hanging. Management is labor-intensive and automation is not possible.

Future

120 plants
per m2



Additional potential:

1. Localized irrigation
2. Designated loading and unloading
3. Easy plant inspection
4. Local monitoring
5. Targeted pest control

QUESTIONS?

CONTACT US!

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