# The Evolution of Urban Controlled Environment Agriculture (CEA) through the Gartner Hype Cycle

***A compelling case for investment in CEA in 2025 and Beyond.***

*A Beyond Farming™ Special Report*

**July 28, 2025**

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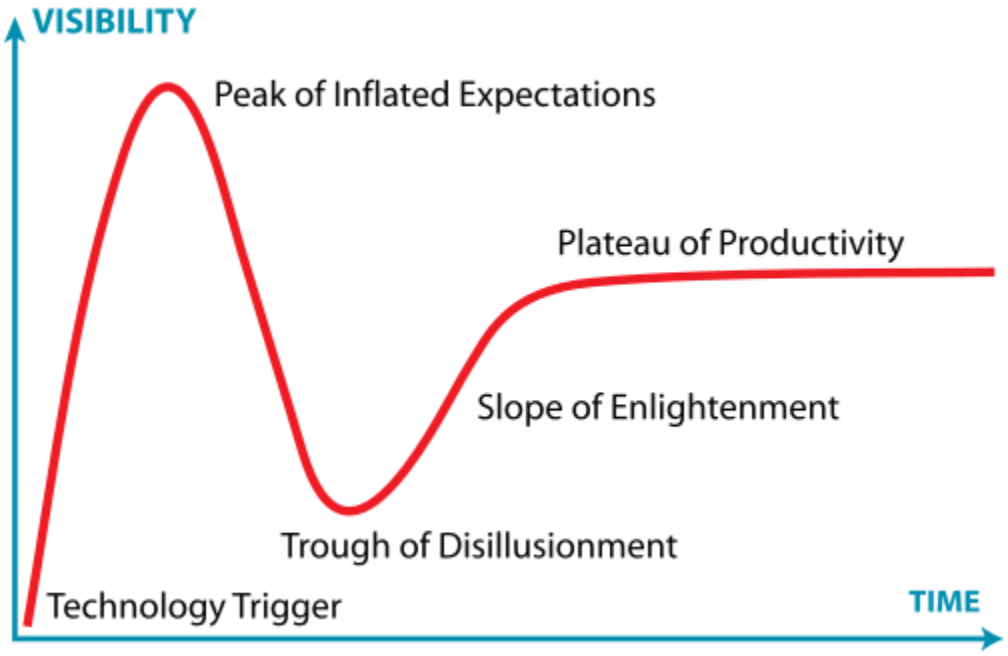


Image Courtesy of Wikipedia.

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## Executive Summary

Controlled Environment Agriculture (CEA), and specifically urban indoor farming, has undergone a rapid rise, fall, and evolution over the past decade. Using the **Gartner Hype Cycle** as a lens, this report traces the sector's trajectory—from breakthrough innovation to sector disillusionment, and now toward scalable productivity.

High-profile companies like **AeroFarms**, **Plenty**, **Bowery**, and **Infarm** helped shape early expectations but stumbled in the trough. In contrast, **Beyond Farming** represents a second-wave evolution—leaner, more resilient, and architected for profitability and scale.

**Beyond Farming** formed its technology division 15 years after providing global professional services to many of the first, and largest, indoor cultivation companies in the world, and from this learned many successes and shortcomings experienced in hydroponic, aquaponic, and aeroponic cultivators using greenhouse, sea container, special purpose building, and hybrid models.  The following report is based on lessons learned from this experience.

## 📈 Understanding the Gartner Hype Cycle

The Gartner Hype Cycle breaks innovation adoption into five distinct phases:

1. **Innovation Trigger** – Breakthrough tech or concept gains early interest.
2. **Peak of Inflated Expectations** – Media and investor hype soar; expectations often exceed deliverables.
3. **Trough of Disillusionment** – Failures mount, startups collapse, and confidence wanes.
4. **Slope of Enlightenment** – Surviving players refine business models and prove commercial viability.
5. **Plateau of Productivity** – Technology achieves broad adoption, and leaders scale profitably.

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## 🧭 Mapping the Urban CEA Industry onto the Hype Curve

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### 1️⃣ Innovation Trigger (2010–2015)

The concept of growing food in vertically stacked layers using artificial lighting and precision-controlled environments exploded from university labs to incubators.

**Key Features:**

- Early hydroponic and aquaponic systems
- Investment from clean tech and sustainability funds
- Focus on food security in urban centers

**Notable Early Players:**

- AeroFarms (founded 2004, gained visibility post-2010)

- Freight Farms
- Green Spirit Farms

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## 2️⃣ Peak of Inflated Expectations (2016–2019)

Massive VC funding poured in. Terms like “feeding 10 billion people” and “revolutionizing farming” drove investor and media frenzy. Most companies claimed energy efficiency and yield gains without proving commercial sustainability.

**Notable Highlights:**

- **SoftBank** invested $200M+ in **Plenty**
- **Bowery Farming** raised over $500M in total before succumbing to a pathogen in its fertigation system that was shared across the facility.
- **Infarm** expanded rapidly across Europe with grocery store micro-units

**The Reality:**

- High CapEx
- High energy costs (especially with metal halide and early-gen LEDs)
- Limited product diversity (mostly leafy greens), or pre-mature harvest (baby)
- Expensive custom-built facilities

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## 3️⃣ Trough of Disillusionment (2020–2023)

The hype crashed into hard economics.The vertical farming sector experienced significant turbulence since its early peak of investor enthusiasm. In May 2021, Sifted published an article titled *“Why Europe’s vertical farming market is wilting”*, which profiled a range of indoor agriculture startups across Europe and the US, highlighting their promise and capital-raising milestones. Companies such as Aerofarms, iFarm, InFarm, Jungle, Plenty, Vertical Future,

Liberty Produce, LettUs Grow, Syan Farms, Grönska, Agricool, Jones Food Company, InstaGreen, Urban Crop Solutions, Intelligent Growth Solutions (IGS), and Farm3 were positioned as key players in the race to disrupt traditional agriculture through technology-driven, climate-resilient growing methods heading into the Trough of Disillusionment, and only a few came out onto the Plateau of Enlightenment:

## 🟢 Active vs 🔴 Inactive (through M&A or closure)

| Company | Status | Notes |
|---|---|---|
| Infarm | 🔴 Inactive | Exited EU, pivoted, closed major operations (ResearchGate, verticalfarmdaily.com) |
| Jungle | 🔴 Inactive | Likely closed with no current activity (no recent presence) |
| Vertical Future | 🔴 Inactive | Faded, no current operations |
| Liberty Produce | 🔴 Inactive | No active public presence, ceased operations |
| LettUs Grow | 🟢 Active | Continues operating under hydro/aeroponic setups |
| Syan Farms | 🔴 Inactive | No data since listing, presumed closed |
| Gronska | 🔴 Inactive | No active data, presumed closed |
| Agricool | 🔴 Inactive | Liquidated in 2022 (ResearchGate) |
| Jones Food Company | 🔴 Inactive | Entered administration April 2025 (AgTechNavigator.com, verticalfarmdaily.com) |
| InstaGreen | 🔴 Inactive | No current operations, likely closed |
| Urban Crop Solutions | 🟢 Active | Operating modular hydroponic systems |

| | | |
|---|---|---|
| IGS | 🟢 Active | Still active in indoor/hydro farms |
| Farm3 | 🟢 Active | Known for indoor IoT/hydro setups |
| Bowery | 🔴 Inactive | Bankruptcy/closure in 2025 (verticalfarmdaily.com) |
| AeroFarms | 🟢 Active | Emerged from bankruptcy; US-only operations, limited EU/UAE (X (formerly Twitter), verticalfarmdaily.com) |
| Plenty | 🟢 Active | Recently emerged from Chapter 11 (verticalfarmdaily.com, iGrow News) |
| Growy | 🟢 Active | Ongoing operations in NL/Singapore |
| GrowUp Farms | 🟢 Active | UK operations ongoing |
| iFarm (iFood) | 🟢 Active | Active in EU, MENA, and North America (Wikipedia, iGrow News) |
| Beyond Farming | 🟢 Active | Listed on the Canadian Securities Exchange (CSE), with Head office in Panama, offices in Australia, Canada, the EU, and the UAE, expanding projects in North and Central America, the EU and the UAE. |

**Lessons Learned:**

- CapEx must be minimized.
- Buildings used for cultivation must **not** be specially purposed and quickly built.
- Cultivation technology must be crop agnostic and be able to configure to the needs required by local markets.
- Projects commenced must be in revenue well within the first year of breaking ground.
- Lighting and HVAC must be energy-efficient, and minimize labour use.

- Water use must be minimized, to the point of projects producing their own water for cultivation.

- Fertilizers, including nitrate, must be minimized, and unused fertilizer recycled back into the fertigation system if possible.

- Operations must minimize and isolate contamination risks at the per crop level, not per building level, or per room level.

- Projects must be repeatable, economic, practical, scalable, sustainable, safe and secure to operate (**REP4S**).*

***Note:** To learn more about **REP4S** and how it applies to CEA please read our paper entitled *Is AgTech Broken_ Here's Our Fix*

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## 4️⃣ Slope of Enlightenment (2023–2025)

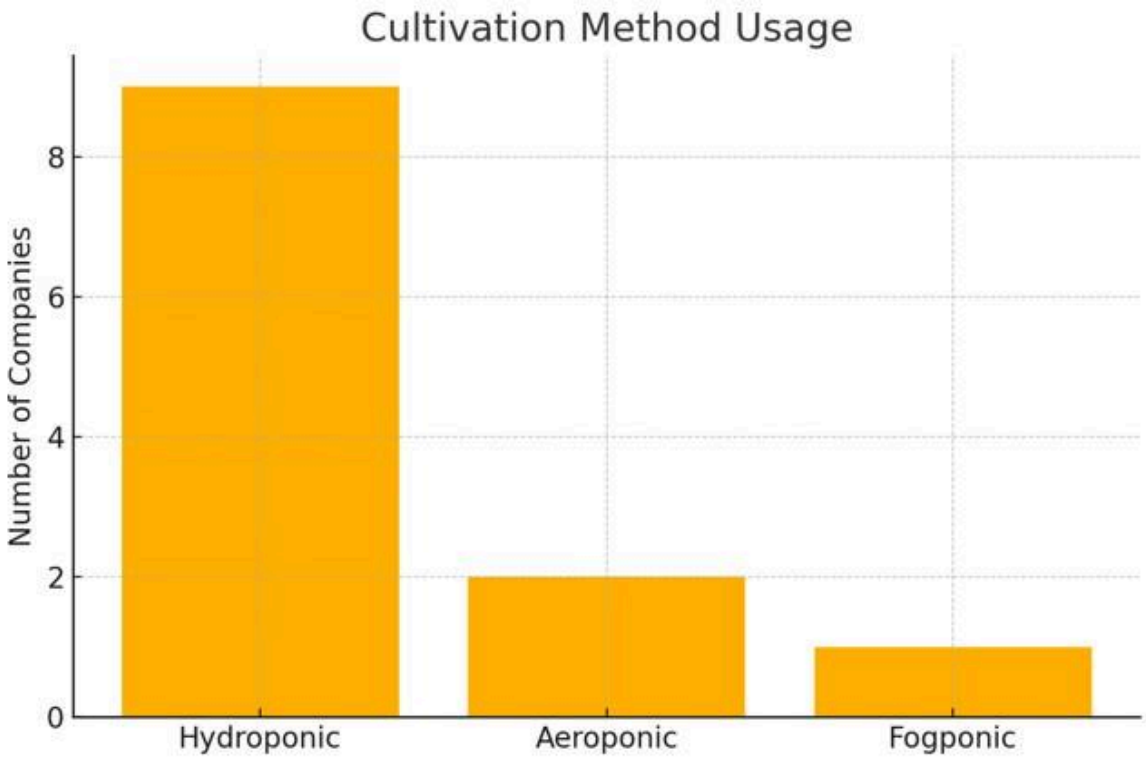
The second generation of players, such as **Beyond Farming**, have emerged from the wreckage with dramatically improved models:

✅ **Key Innovations:**

| Category | Early CEA | Beyond Farming Solution |
|---|---|---|
| Containment | Greenhouses / Custom Builds | Modular prefab habitats in non-specialized buildings |
| Irrigation | Hydroponics / Aeroponics | Proprietary Fogponics — reduces water + risk |
| Lighting | Metal Halide / Early LED | Programmable, cool-operating full-spectrum LEDs |
| Power & HVAC | Massive chillers + pumps | Downsized components, AI-based load control |
| Fertigation | Shared lines, contamination risk | Isolated systems for each rack/habitat |
| Labor | Human-intensive tasks | AI-controlled environments with minimal intervention |

## 🔍 Cultivation Methods:

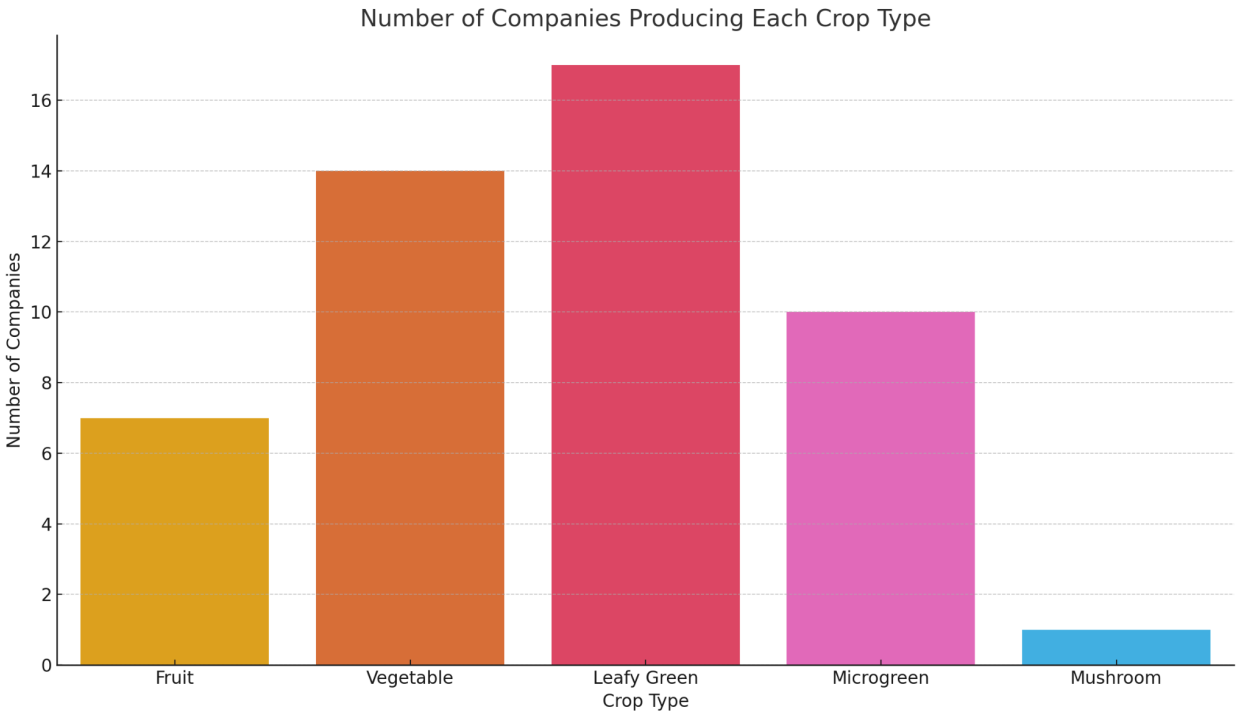
| Method | Active Count | Companies Example |
|---|---|---|
| Hydroponic | 14 | Infarm, LettUs, Urban Crop, iFarm, etc. |
| Aeroponic | 3 | AeroFarms, LettUs (mixed), Jungle? |
| Fogponic | 1 | **Beyond Farming** (the only one) |



## 🍓 Available Crops:

**Crop Type Capability by Company (Yes/No Format)**

| Company | Fruit | Vegetable | Leafy Green | Microgreen | Mushroom | Root Vegetable |
|---|---|---|---|---|---|---|
| Beyond Farming | Yes | Yes | Yes | Yes | Yes | Yes |
| Infarm | No | Yes | Yes | Yes | No | No |
| AeroFarms | No | Yes | Yes | Yes | No | No |
| Plenty | Yes | Yes | Yes | Yes | No | No |
| iFarm | Yes | Yes | Yes | Yes | No | No |
| Jungle | Yes | Yes | Yes | Yes | No | No |
| Vertical Future | Yes | Yes | Yes | Yes | No | No |
| Liberty Produce | No | Yes | Yes | Yes | No | No |
| LettUs Grow | No | Yes | Yes | Yes | No | No |
| Syan Farms | No | Yes | Yes | Yes | No | No |
| Grönska | Yes | Yes | Yes | Yes | No | No |
| Agricool | Yes | Yes | Yes | Yes | No | No |
| Jones Food Co | No | Yes | Yes | Yes | No | No |
| InstaGreen | No | Yes | Yes | Yes | No | No |
| Urban Crop Solutions | Yes | Yes | Yes | Yes | No | No |
| IGS | No | Yes | Yes | Yes | No | No |
| Farm 3 | Yes | Yes | Yes | Yes | No | No |
| Bowery | No | Yes | Yes | Yes | No | No |



While many vertical farming companies focus on leafy greens and microgreens, very few can offer a broad spectrum of crop categories. **Beyond Farming stands out as the only company capable of producing all five key categories: fruits, vegetables (including root vegetables), leafy greens, microgreens, and mushrooms—without requiring any modification to its underlying technology**.* This highlights the modular and highly configurable nature of Beyond Farming's system architecture, which contrasts with the more specialized and constrained technologies used by competitors like Bowery, AeroFarms, and LettUs Grow. These competitors, although efficient in their specific niches, lack the adaptability to switch seamlessly between different crop types. For investors, this flexibility positions Beyond Farming to meet diverse market demands, maximize utilization of infrastructure, and scale efficiently across regions and climates.

***Note:** To learn more about why "Pure" crops are here to stay why this provides a business case for CEA please read our paper entitled *Why 'Pure Produce' is the Future of Food*.

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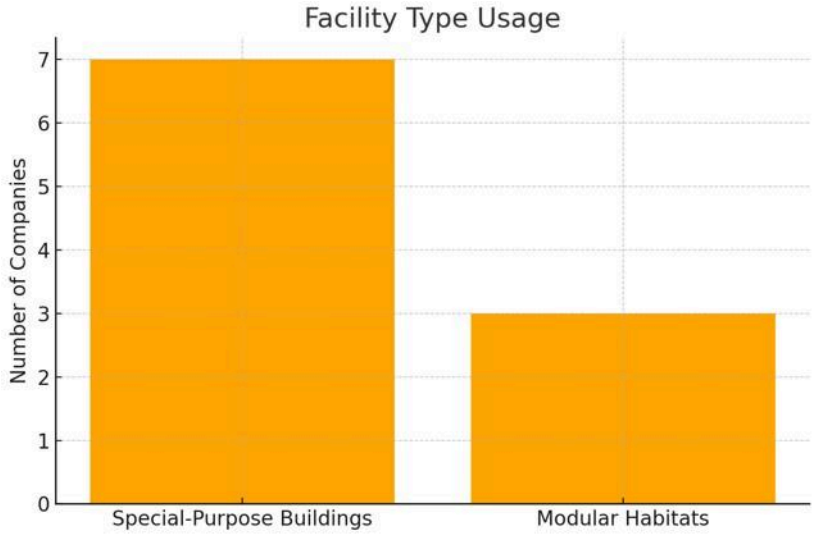
## 🏭 Facility Types:

| Facility Type | Companies count |
|---|---|
| Special-Purpose Buildings | 15 |
| Modular/Enclosed Habitats | 3 (Beyond Farming, iFarm container, Vertical Future) |

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## 💧 Water Use Differences

- **Hydroponic farms (Infarm, Bowery, Plenty, iFarm, etc.)** typically use 4–10 L/kg and are susceptible to system-wide contamination (e.g., Bowery recall).

- **Beyond Farming's fogponic habitats** use **<1 L/kg**, operate in sealed root chambers, and **mitigate systemic contamination risks** seen in full-building hydroponics (ifarm.fi, ResearchGate, iGrow News).

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## 🧠 IP Ownership & Business Structure:

- **Beyond Farming**: Owns patented, fully integrated hardware, AI software, and fertigation systems—vendor-independent.

- **Infarm, Bowery, Plenty, AeroFarms**: Rely on third-party hardware or fragmented supply chains.

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## 💸 Access to Capital:

- **Beyond Farming**: Publicly listed (CSE: BYFM*)—provides market liquidity.

- **All others**: Privately held; limited shareholder liquidity.

***Note:** *Beyond Farming is the resulting public entity from the amalgamation of TheraCann International Benchmark Corp (TIBC) and its publicly listed subsidiary Sprout AI Inc. (SAI) on the Canadian Securities Exchange (CSE). The amalgamation has received majority approval from both companies' Shareholders and Directors and is now in the final stage of CSE review. Upon resumption of trading, the company will be listed under the ticker **CSE: BYFM**. Beyond Farming also plans to secure listings on two additional public markets, with the goal of being active on three exchanges by the end of 2026.*

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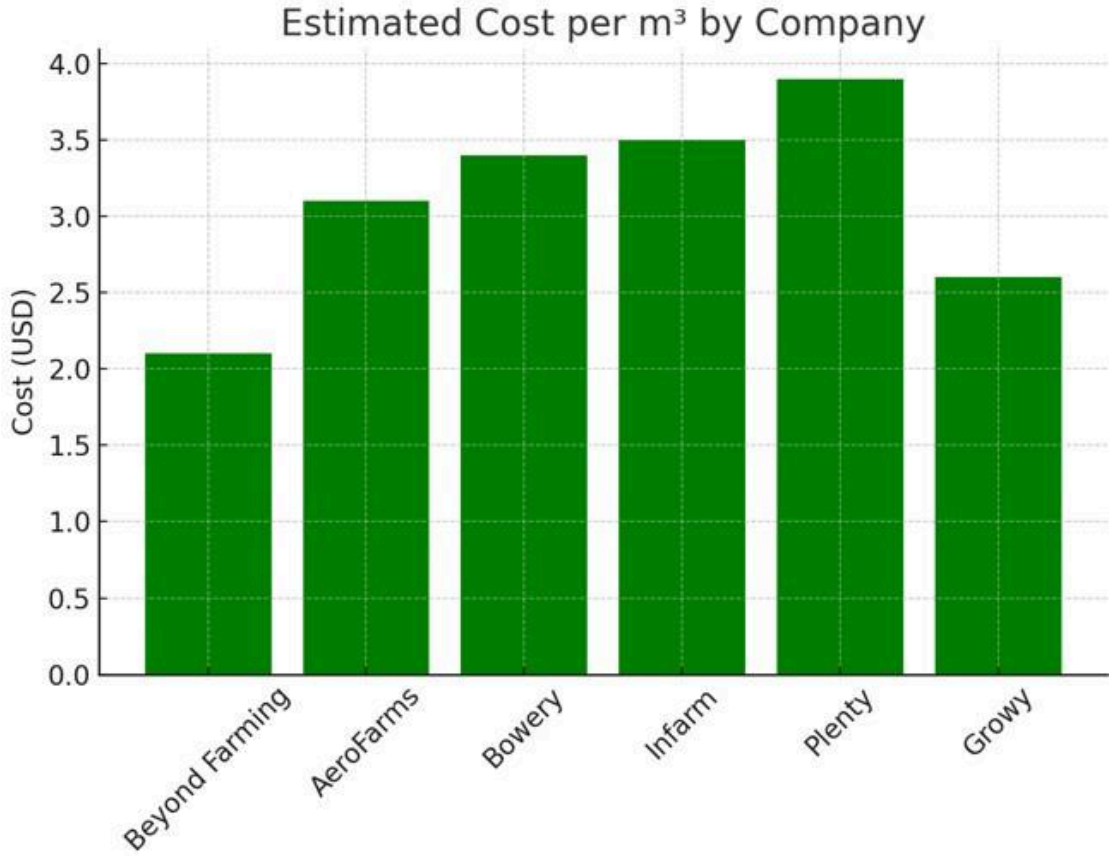
## 💵 Estimated Cost per m³:

| Company | Cost per m³ (USD) |
|---|---|
| Beyond Farming | **$2.10** |
| iFarm | $2.90 |
| Growy | $2.60 |
| AeroFarms | $3.10 |
| Bowery | $3.40 |
| Infarm | $3.50 |
| Plenty | $3.90 |

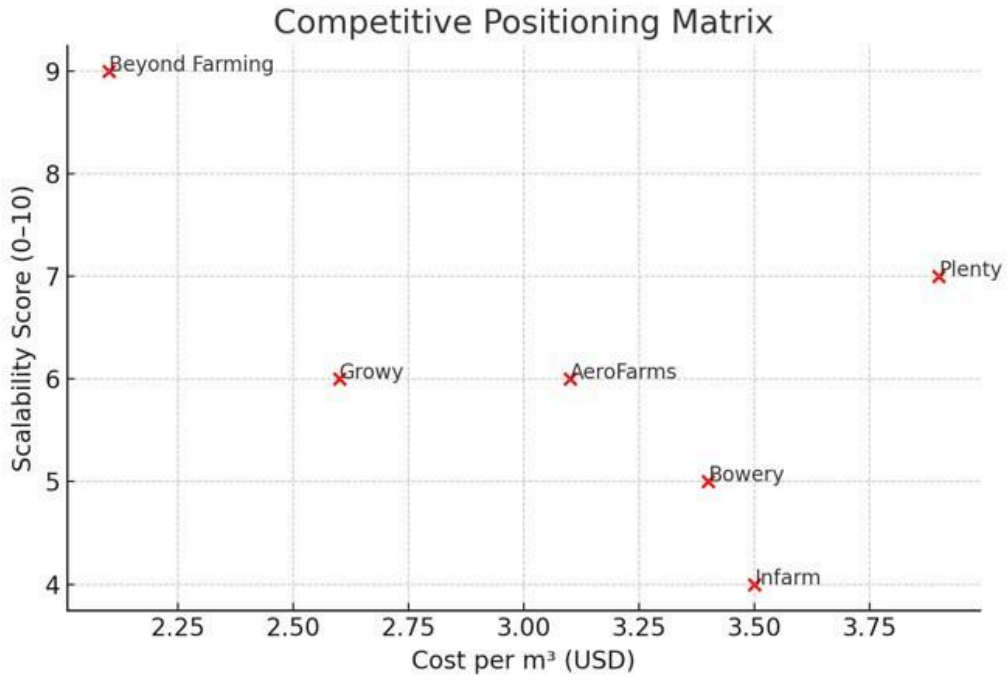
*(Estimates based on public OpEx/CapEx comparisons.)*



## 🧭 Competitive Matrix:

- **X-axis**: Cost per m³ (USD, lower is better)
- **Y-axis**: Scalability Score (0–10 scale, based on modularity and global deployment ability)

| Company | X (Cost/m³) | Y (Scalability) |
|---|---|---|
| Beyond Farming | 2.1 | 9 |
| iFarm | 2.9 | 7 |
| Growy | 2.6 | 6 |
| AeroFarms | 3.1 | 5 |
| Bowery | 3.4 | 4 (limited after closure) |
| Infarm | 3.5 | 5 |
| Plenty | 3.9 | 6 |



## ✅ Summary of Plateau of Enlightenment

- **Active vs Inactive**: 16 companies total pre-Trough of Disillusionment, 10 remain active, 6 inactive.
- **Hydroponics is dominant**; only Beyond Farming offers fogponic tech in isolated habitats.
- **Water use**: Hydroponic systems use 4–10 L/kg with contamination risk; fogponics uses <1 L/kg with enhanced safety.
- **Scalability**: Beyond Farming leads due to modular fog systems and patent ownership.
- **Cost per m³**: Beyond Farming offers one of the lowest costs (~$2.10/m³) among competitors.

This situational analysis clearly positions **Beyond Farming** as a cost-efficient, scalable, water-smart, and patent-rich leader in vertical farming that is now positioned on the plateau of productivity of the Hyper Gartner Curve.

Combined with Beyond Farming's commitment to designing each Farm as a Solution (FaaS) Facility to meet its stringent requirements to be repeatable, economic, practical, scalable, sustainable, safe and secure (REP4S), provides Beyond Farming is a distinct competitive advantage over those competitors who are unable to provide a global configurable solution.

Those inactive companies further validate the need for robust systems and modular flexibility

**Financial Model:**

- 60% EBITDA
- <4-year ROI
- Localized production = minimized distribution cost
- Zero-contaminant guarantee = premium pricing and certifications

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## 5️⃣ Plateau of Productivity (2025 onward)

As Beyond Farming deploys CPCs (Controlled Production Centers) in **North America, Central America, the EU, and the UAE**, and more, the company is positioned at the **Plateau of**

**Productivity** stage. While most CEA startups focused on capital-raising and tech demos, Beyond Farming is focused on **replicable, profitable deployments**.

Like **Dell** in the PC era, **Apple** in smartphones, or **Amazon** in cloud infrastructure—Beyond Farming is building not just tech, but a **platform**.

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## 📌 Conclusion: This Time Is Different

Yes, early failures happened. But so did they in:

- Personal computing (Compaq, Gateway, PalmPilot)
- Smartphones (BlackBerry, Nokia)
- Electric vehicles (Fisker, Better Place)

These weren't dead ends—they were **market corrections** that cleared the path for scaled, investable innovation.

Today, the CEA industry has:

- Sustainable, modular, scalable systems
- Mature LED and HVAC technology
- Proprietary fertigation and fogponic breakthroughs
- Real data showing profitability and ROI under 3 years
- AI-managed operations with minimal labor costs

💡 **And Beyond Farming is leading this second wave.**

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## 💼 What Happens Next?

Beyond Farming is now in the final phase of amalgamation and regulatory clearance for **public listing on the Canadian Securities Exchange (CSE)** under the ticker **BYFM**.

Upon resumption of trading:

- Investors will be able to participate in a simple capital structure backed by real assets and revenue potential.
- Expansion capital will be deployed to launch CPCs in North and Central America, the EU and UAE and beyond.

🛫 From there, BYFM is preparing dual listings on exchanges in **Europe and Asia** to meet investor demand in regions actively investing in food security, energy independence, and urban sustainability.

For investors, this is a rare opportunity to enter **just as the industry moves from experimentation to expansion**—and just before global equity market exposure begins.

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📬 **Interested in participating early?**

## 📩 Contact for Investment

For access to investment opportunities:

📧 investment@beyondfarming.com
🌐 https://beyondfarming.com/investors

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## 📡 Stay Connected

For updates, investment opportunities, and information on Pure Produce partnerships:

🌐 **Website**: www.beyondfarming.com
🔗 **LinkedIn**: linkedin.com/company/beyondfarmingbyfm
📘 **Facebook**: facebook.com/beyondfarmingbyfm
📸 **Instagram**: instagram.com/beyondfarmingbyfm
📧 **Email**: mainweb@beyondfarming.com

## 📩 Contact for Licensing, or Deployment

For access to verified data, or Pure Produce licensing and CPC deployment:

📧 mainweb@beyondfarming.com/get-started

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## 🔐 Verification Note

All claims made in this report regarding Beyond Farming (BYFM) operations, technology, and purity standards are based on internal logs, controlled environment certifications, QA records, and peer-reviewed assessments conducted between 2022–2025.

Full audit trails and environmental sensor logs are available upon request for regulatory or institutional due diligence.

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## ⚠️ Forward-Looking Statements Disclaimer

This report contains certain forward-looking statements within the meaning of applicable Canadian securities laws. These statements reflect the current expectations and projections of Beyond Farming (BYFM) regarding future growth, deployment targets, financial results, and market adoption. These statements are not guarantees of future performance and involve known and unknown risks, uncertainties, and other factors that may cause actual results, performance, or achievements to differ materially from those expressed or implied by such statements. Readers are cautioned not to place undue reliance on forward-looking statements. Beyond Farming undertakes no obligation to update or revise any forward-looking statements except as required by law.

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