



GREENFIELD HYDROPONICS GLOBAL

Turnkey System for creating Urban Organic Produce Farms



Local and fresh — demand driving verticalization

Executive summary and perspective

| | |
|---|---------------------|
| 1 | Local and fresh |
| 2 | Economic headwinds |
| 3 | Food and ag labor |
| 4 | Proteins reimagined |



As consumer demands change, controlled environment agriculture (CEA) offers growth opportunities for organizations across the food value chain through verticalization, which promotes more transparent, sustainable and safe food production practices

- 1** Demand for local and fresh
▶ Drivers include consumers' preference to support local communities, sustainability and transparency and eat healthier and more nutritious foods.
- 2** Control over supply chains
▶ Vertical integration allows consumer facing companies to meet their customers' needs by tightening control over supply chains and strategically managing the bargaining powers of both suppliers and buyers.
- 3** Technological advancements
▶ Investment in emerging technologies will help address the labor and cost challenges confronting CEA in its early stages of development.
- 4** Access to working capital
▶ Additional breakthroughs are likely dependent on improved access to capital and financial investments from venture capital, private equity or mergers & acquisitions (VC/PE/M&A) activity, which will allow CEA to achieve broader commercial scale.

“

There is great market opportunity for CEA to disrupt the agriculture and food industry for the better as CEA farmers rapidly develop and adopt emerging technologies with a focus on automation and data analytics. With strategic investments in both the digital and physical infrastructure, cost of production will continue to decrease and profits increase.

With so many communities feeling the consequences of the COVID-19 pandemic, the war in Ukraine, and climate change, food security has moved up national security agendas across the world. CEA will help create more geographically diverse and resource-efficient production methods in order to promote resiliency and security as we continue to face these challenges and many others.

Rob Dongoski, EY Global Food and Agribusiness Leader

1

WHAT DO WE DO?

We build hydroponic indoor cultivation equipment.

We design industrial facilities to grow organic vegetables and hydroponic fodder in controlled environments.



Agriculture for the Future

The current global population is 7.8 billion, and it is expected to reach 9.7 billion by 2050. The current prediction is that we will need to increase global food production by up to 70% to feed everyone. To make matters worse, we will need an additional 20% of land to achieve this using current agricultural practices.

Climate change is already affecting farmers worldwide with extreme weather patterns, including floods and heatwaves, increasing in both frequency and intensity.

Furthermore, an increasing dependence on chemical herbicides and pesticides not only has a higher cost for farmers but also for natural ecosystems and the organic matter necessary to maintain soil quality.

Controlled Environment Agriculture (CEA) can help take positive steps towards a more sustainable and profitable future by reducing water consumption, the need for chemical intervention, logistics, and land use. In fact, farmers in Saudi Arabia are using CEA to grow fresh produce where it would be nearly impossible with the scorching outdoor temperatures of the country and is ideal due to abundant sunlight for solar energy.

According to a report by the Boston Consulting Group (BCG), around one-third of food produced worldwide goes to waste, and a significant portion of that loss occurs along the global supply chain. Overall, this translates to 1.6 billion tons of food, with an approximate value of \$1.2 trillion.

CEA enables locally grown and quickly marketable products that can be purchased and consumed where they are produced, with the traceability and integrity demanded by food supply chains.

Instead of shipping their products worldwide, farmers can use CEA to cultivate a wider variety of products locally. This benefits everyone involved in the supply chain, including the consumer. In addition to a better choice of products, CEA allows for consistent quality and quantity of food delivery. There is also no need to add preservatives or wax coatings to keep the produce fresh and ready for the consumer.

From an environmental perspective, the WorldWatch Institute found that the conventional food distribution system uses 4 to 17 times more CO2 than local and regional systems.

ALL GROWING SYSTEMS

FOOD FOR PEOPLE

/ 01

Hydroponic Tower

Design for leafy/strawberry/herb vertical planting

| | |
|----------------------|---|
| Name | Grow Tower |
| Type | 6P7/6P10/6P15 |
| Plant Hole | 42/60/90 |
| specification | With/without rack/water supply and drainage/water pump/LED lamp |



02.

NFT Channels

ZIP System



| | |
|----------------------|--|
| Name | NFT Channels |
| Type | Single/double side design |
| Plant type | Green Leafy Vegetables |
| specification | With water supply and drainage/water pump/LED lamp |

03.

Vertical Channels

Design for **planting** green leafy / herbs and green decoration.

| | |
|----------------------|--|
| Name | ZIP System |
| Type | Single/double side design |
| Plant type | Green Leafy Vegetables |
| specification | With water supply and drainage/water pump/LED lamp |



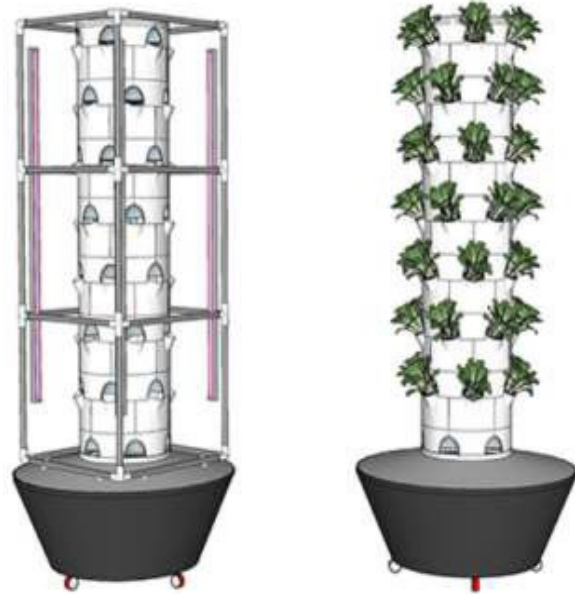
04.

Microgreens



| | |
|----------------------|---|
| Name | Microgreen System |
| Type | 3-1/3-2/5-2/5-3/7-2/7-3 |
| Daily Output | 20KG-150KG |
| Specification | With/without water tank/water supply and drainage/water pump/LED lamp and rack/wheels |

/ 01 Hydroponic Tower



System Type : Commercial/Household
 Character : with movable wheels
 Hydroponic System Type : Vertical Garden Tower
 Total Planting Layer : 7 Layers
 Total Planting Holes : 42 Holes
 Crop Type : Lettuce/Leafy Vegetables/tomato
 Water pump : AC100-240V 50/60HZ,DC12V/24W
 Water tank Volume :100L
 More vegetables:amaranth,cabbage,Spinach, etc

Sizes

68 plants per tower · 1.4 m (height) · 9 stackable modular sections
 100 plants per tower · 1.8 m (height) · 13 stackable modular sections
 132 plants per tower · 2.1 m (height) · 17 stackable modular sections
 164 plants per tower · 2.5 m (height) · 21 stackable modular sections
 196 plants per tower · 2.9 m (height) · 25 stackable modular sections



With HGH Grow Tower, you can grow up to 30% more food, 3x faster — while saving up to 90% more space and 98% more water compared to traditional growing methods. Plus, there's no digging, weeding, or watering.

You can grow food in a variety of unlikely places indoors and out — thanks to the unique design of our vertical aeroponic growing systems. Starter systems require about 225 SF, a clean water source, electrical outlet, and sunlight (or grow lights).

For most herbs and leafy greens, the seedling to harvest cycle can be as short as 21 days.

Many hydroponic farming systems limit what you can grow. But **HGH Grow Tower supports more than 150 different plants** from delicate herbs and greens to hearty fruiting crops, such as tomatoes and squash. As a result, you can adapt your crop selection strategy on the fly to meet market demand.

1

WHAT CAN WE GROW IN THE TOWERS? Fruit and Vegetables

Amaranth (vegetable type)

Arugala

Bayam

Beans: Lima, Bush, Pole, Shell, Fava, Green

Broccoli

Broccoli Raab

Brussels Sprouts

Cabbage & Chinese Cabbage

Cauliflower

Chard, all types

Chicory

Collards

Cucumbers

Cress

Dandelion, Italian

Eggplant, European & Asian

Endive

Escarole

Garbanzo Beans

Courds, edible & ornamental

Kale

Kinh Giol

Kohlrabi

Komatsuna

Leeks

Lettuce, all types

Mesclun varieties

Melons, all types

Misome

Mizuna

Mustard Greens

Ngo Fai

Okra

Pak Choy

Peas, all types

Peppers, all types

Radicchio

Sorrel

Spinach

Squash, all types

Strawberries

Tomatoes, all types



WHAT CAN WE GROW IN THE TOWERS?

Herbs

| | | |
|---------------------------------|------------------------|----------------------------|
| Angelica | Echinacea (Coneflower) | Nettle |
| Anise Hyssop | Epazote | Oregano |
| Basil, all types | Feverfew | Parsley (leafy types only) |
| Bee Balm | Flax | Passion Flower |
| Borage | Garlic Chives | Pleurisy Root |
| Calendula | Goldenseal | Pyrethrum |
| Catmint | Hyssop | Rosemary |
| Catnip | Lavender | Rue |
| Chamomile | Leaf Fennel | Sage |
| Chervil | Lemon Balm | Salad Burnet |
| Chives | Lemon Grass | Saltwort |
| Cilantro (Coriander) & Culantro | Lovage | Savory |
| Citrus Basil | Marjoram | Shiso |
| Cumin | Mexican Mint Marigold | Stevia |
| Cutting Celery | Mibura | Thyme |
| Dandelion | Milk Thistle | Valerian Wormwood |
| Dill | Mint, all varieties | |



1

WHAT CAN WE GROW IN THE TOWERS?

Flowers

Edible

- Calendula
- Carthamus
- Dainthus
- Hyacinth Bean
- Marigolds
- Monarda
- Nasturtiums
- Pansies
- Salvia
- Scarlet Runner Bean
- Sunflowers (swarf varieties only)
- Violas



Ornamental

- | | | | |
|------------------|---------------|------------------|-------------|
| Ageratum | Celosia | Impatiens | Rudbeckia |
| Agrostemma | Coleus | Kale, ornamental | Sanvitalia |
| Amми | Cosmos | Morning Glory | Scabiosa |
| Amaranth, globe | Craspedia | Nigella | Snapdragon |
| Amaranthus | Datura | Petunia | Statice |
| Artemisia | Delphinium | Phlox | Stock |
| Aster | Digitalis | Poppy | Strawflower |
| Bells of Ireland | Eucalyptus | Polygonum | Sweet Peas |
| Bupleurum | Eurphorbia | Ptilotus | Thunbergia |
| Cardoon | Forget Me Not | Safflower | Verbena |
| Centaurea | Hibiscus | Salpiglossis | Yarrow |
| | | | Zinnia |

NFT Laminar Nutrient Flow Technique

The advantage of the NFT system that stands out in relation to other hydroponic systems is the high quality obtained in different horticultural products in a short period of cultivation, as well as in yield. The constant supply of water and nutrients allows plants to grow without stress and obtain the productive potential of the crop.

In addition, it is possible to obtain earliness, which allows a better price in the market and presence in all seasons. On the other hand, perhaps the most important advantage is the saving of water in these cultivation systems, as well as fertilizers by allowing the recirculation of the nutrient solution.



WHAT CAN WE GROW IN THESE CHANNELS?

Amaranth (vegetable type)

Arugala

Bayam

Beans: Lima, Bush, Pole, Shell, Fava, Green

Broccoli

Broccoli Raab

Brussels Sprouts

Cabbage & Chinese Cabbage

Cauliflower

Chard, all types

Chicory

Collards

Cucumbers

Cress

Dandelion, Italian

Eggplant, European & Asian

Endive

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Courds, edible & ornamental

Kale

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Leeks

Lettuce, all types

Mesclun varieties

Melons, all types

Misome

Mizuna

Mustard Greens

Ngo Fai

Okra

Pak Choy

Peas, all types

Peppers, all types

Radicchio

Sorrel

Spinach

Squash, all types

Strawberries

Tomatoes, all types



03. Vertical Growth Channels

Design for planting green leafy / herbs and green decoration.

For most of the time, plants have been limited to growing in the ground and have therefore had to grow horizontally: roots downwards, stems and leaves upwards. The advent and popularization of hydroponics changed all that. By isolating nutrients and minerals from the soil and adding them directly to the water, the plants were able to grow freely away from the soil, leading to the practice of "vertical farming."

The growing area of our container houses 88 panels of high-density five-channel plants. More than any other feature, these panels maximize usable space on the farm to unlock new growing possibilities, growing styles, and yield potentials. The removable panels, lightweight and resistant, are made of high-impact polystyrene suitable for food. **The five channels are paired with a cross-linked foam culture medium and a strip that absorbs drip, giving the plants a structure on which to grow, while ensuring moisture remains at the root.**

The five-channel design also allows you to maximize production, by also activating the unused space between plants:

For example, while large plants occupy channels 1-3-5, the operator can use the remaining channels 2 and 4 to grow small root vegetables. Alternatively, you can plant small crops that can be planted at each farm, also taking advantage of the entire linear growing space.



The mobile GHG ZipRacks

Tower-carrying ZipRacks save time and labor. Big crop yields lead to healthy profits. Time to break-even is measured in months, not years.

Tailored plumbing kits with automated water management systems take the stress out of making sure your plants are happy and healthy.

Proven crop yields range from 2 to 6 kilograms of produce per tower depending on the crop.

Crop turns as short as two weeks. Custom, high-efficiency LED lights maximize efficiency and crop production.

Increased levels of consumers' awareness regarding consumption of healthy and nutritious foods are changing what, where and how food is produced

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Drivers of local and fresh food production



“Eat local” and support local community

- ▶ Due in large part to the pandemic, **consumption of local foods increased by 40%–45% from 2019 to 2022**
 - ▶ In 2015, the U.S. Department of Agriculture (USDA) estimates that just 115,000 operations were selling direct-to-consumer (to on-farm stores, farm stands and online marketplaces), totalling \$3 billion in sales.
 - ▶ In 2020, over 147,000 US farms produced and sold food locally through direct marketing practices, resulting in \$9.0 billion in revenue.
- ▶ The **market of CEA is growing** as producers are focusing on local production near urban areas that reduce cost and time of transportation and employ local workers.



Health and nutrition

- ▶ Customers are looking for **pesticide-free, residual free and organic food products**.
- ▶ As a result, **demand for CEA and vertically farmed crops has grown**, as they provide such products that can be delivered to retail stores within hours of harvest.
- ▶ Statista reports that the market value of **organic food markets worldwide is forecasted to increase by 74% from 2021 to 2026**.



Sustainability

- ▶ Local sourcing enables supply chain players to **lower their carbon footprint and retain the essential nutrients in produce** that can be lost with long storage and transportation time.



Transparency in the food value chain

- ▶ Customers want to know **how, when, where and how** their food is grown, packaged and transported.
- ▶ **Technology is enabling consumers to have access to smart labels that trace the entire journey of products**.
- ▶ Strategies like **vertical integration also allow for better product tracking**.

Challenges in delivering local and fresh with traditional methods

- ▶ Local and fresh is particularly challenging in **urban environments**.
 - ▶ Infrastructure does not support many common growing techniques.
- ▶ **Remote communities, such as Hawaii, do not have the land to feasibly produce food locally**.
 - ▶ Hawaii only has enough food to feed the population for three days.
- ▶ **Harsher climates like deserts are unable to grow all food locally**.

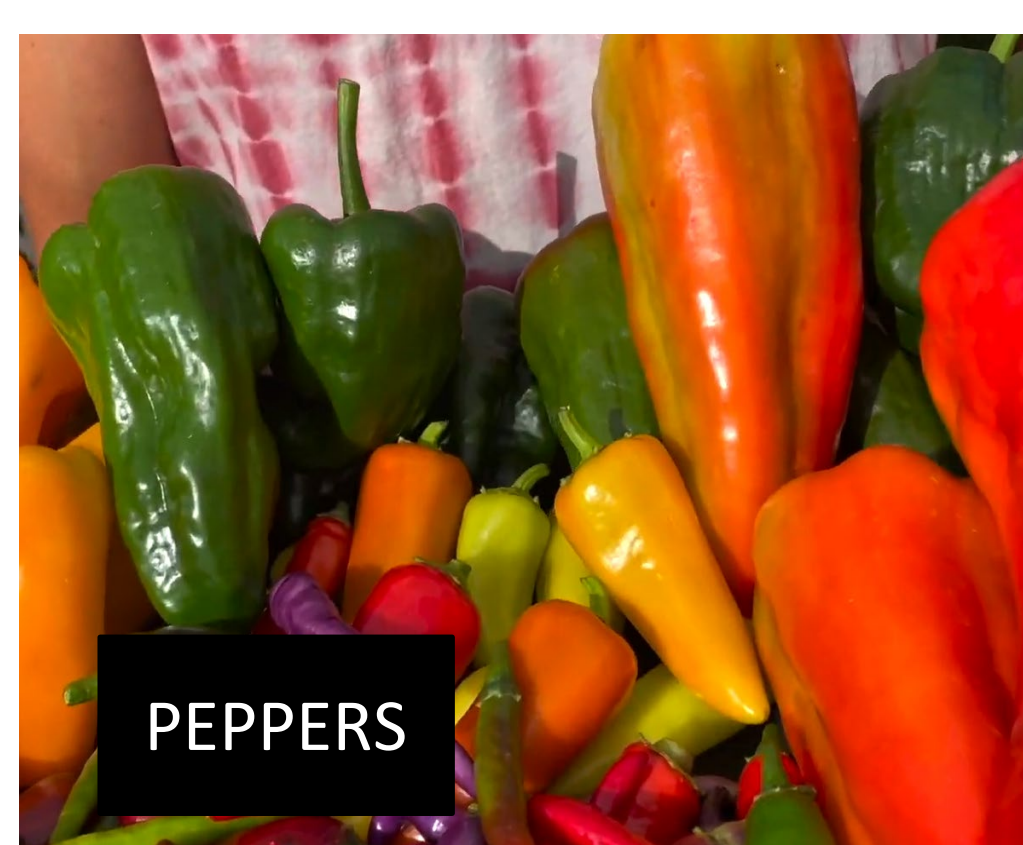
Source: EY-Parthenon analysis.



CABBAGE



BROCCOLI



PEPPERS



ZUCCINI



TOMATOES



CELERY



ZUCCINI / COURGETTE



MELONS



CULTIVATION TOWERS



STRAWBERRIES

Vertical Growth Channels

Lettuce

| | | |
|---------------------------|-------------------------|------------------------------|
| Adriana Butterhead | * Green Star Leaf | Ruby Sky Leaf |
| Aerostar Romaine | Iceberg Lettuce | * Salanova Green Butter |
| * Alkindus Butterhead | Lettony Leaf | Salanova Green Incised |
| Annapolis Romaine | Livinga Lollo Rossa | Salanova Green Oakleaf |
| Antonet Lollo Rossa | * Magenta Summer Crisp | * Salanova Green Sweet Crisp |
| Auvona Romaine | Mirlo Butterhead | * Salanova Red Butter |
| Bambi Bibb | Monte Carlo Romaine | * Salanova Red Oakleaf |
| Black Seeded Simpson Leaf | Mottistone Summer Crisp | Salanova Red Sweet Crisp |
| Blackhawk Leaf | Muir Summer Crisp | Salvius Romaine |
| Breen Romaine | Nancy Butterhead | Skyphos Butterhead |
| Buttercrunch Bibb | * Nevada Summer Crisp | Sparx Romaine |
| Celinet Summer Crisp | * New Red Fire Leaf | Spretnak Bibb |
| Cherokee Summer Crisp | Newham Bibb | Spritzer Oakleaf |
| Coastal Star Romaine | Oscarde Oakleaf | Starfighter Leaf |
| Concept Summer Crisp | Outredgeous Romaine | Sulu Oakleaf |
| Dark Red Lollo Rossa | Panisse Oakleaf | Sylvesta Butterhead |
| Deer Tongue Bibb | Parris Island Romaine | Tamarindo Leaf |
| Defender Romaine | Red Cash Romaine | Tango Oakleaf |
| Dragoon Romaine | Red Cross Butterhead | Teide Summer Crisp |
| Edox Butterhead | Red Sails Leaf | Thurnius Romaine |
| Fenberg Romaine | Red Saladbowl Oakleaf | * Tropicana Leaf |
| Firecracker Leaf | Red Rosie Romaine | Truchas Romaine |
| Flashy Trout Back Bibb | * Rex Butterhead | Two Star Leaf |
| * Fusion Green Romaine | Ridgeline Romaine | Vulcan Leaf |
| Garrison-Oakleaf | Rosaine Bibb | Waldmann's Dark Green Leaf |
| Green Forest Romaine | Rouge d'Hiver Romaine | Winter Density Bibb |
| Green Saladbowl Oakleaf | * Rouxai Oakleaf | |

Leafy Greens

| | |
|----------------------------|---------------------------------|
| * Astro Arugula | * Koji Tatsoi |
| Sylvesta Arugula | * Red Kingdom Mizuna |
| * Wasabi Arugula | * Golden Frills Mustard Greens |
| Farao Cabbage Leaves | Ruby Streaks Mustard Greens |
| Red Express Cabbage Leaves | Scarlet Frills Mustard Greens |
| Claytonia | Suehlihung No. 2 Mustard Greens |
| * Flash Collards | Dark Green Orach |
| * Champion Collards | Ruby Red Orach |
| Dandelion | * Green Pac Choi |
| Eros Escarole | Li Ren Choi |
| Rhodos Endive/Frisee | * Red Pac Choi |
| * Black Magic Kale | Perseo Radicchio |
| Red Russian Kale | Seaside Spinach |
| Redbor Kale | Space Spinach |
| * Scarlet Kale | * Bright Lights Swiss Chard |
| Toscana Kale | Ruby Red Swiss Chard |
| * Winterbor Kale | Watercress |

Herbs

| | |
|----------------------------|--------------------------|
| Armaranth | Sweet Marjoram |
| Elidia Basil | Zaata Marjoram |
| * Genovese Basil | Common Mint |
| Lemon Basil | * Greek Oregano |
| Red Rubin Basil | Moss Curled Parsley |
| * Thai Basil | * Giant of Italy Parsley |
| Cutting Celery | Primed Rosemary |
| Vertissimo Chervil | Pipicha |
| Dolores Chives | Rosemary |
| Purly Chives | Common Sage |
| * Calypso Cilantro | Pineapple Sage |
| Confetti Cilantro | Green Shiso |
| Marino Cilantro | Britton Shiso |
| Goldkrone Dill | * Red Shiso |
| * Hera Dill | Red Veined Sorrel |
| Bronze & Green Fennel Leaf | Orange Thyme |
| Grosfruchtiger Fennel Leaf | * Summer Thyme |
| Lemon Verbena | * Winter Thyme |



The interest in microgreens or micro-sprouts, as in sprouts, is growing more and more within the United States, we have seen how the consumption of these live foods has had a very interesting exponential growth. From our point of view, we believe that this boom may be because every time these micro vegetables are gaining more prominence in healthy eating, too, because more and more hoteliers are looking to add differentiating culinary touches that make their dishes something out of the ordinary. Be it one or the other, the important thing is that the demand is increasing and will grow more and more.



High demand product

Potential customers: hospitality, hotels, individuals

organic farming



We identified all the components. Now we will create a customized urban farms

An urban farm is a space used to grow food and plants in an urban environment. These types

of farms are placed in an indoor controlled environment. Advantages are:

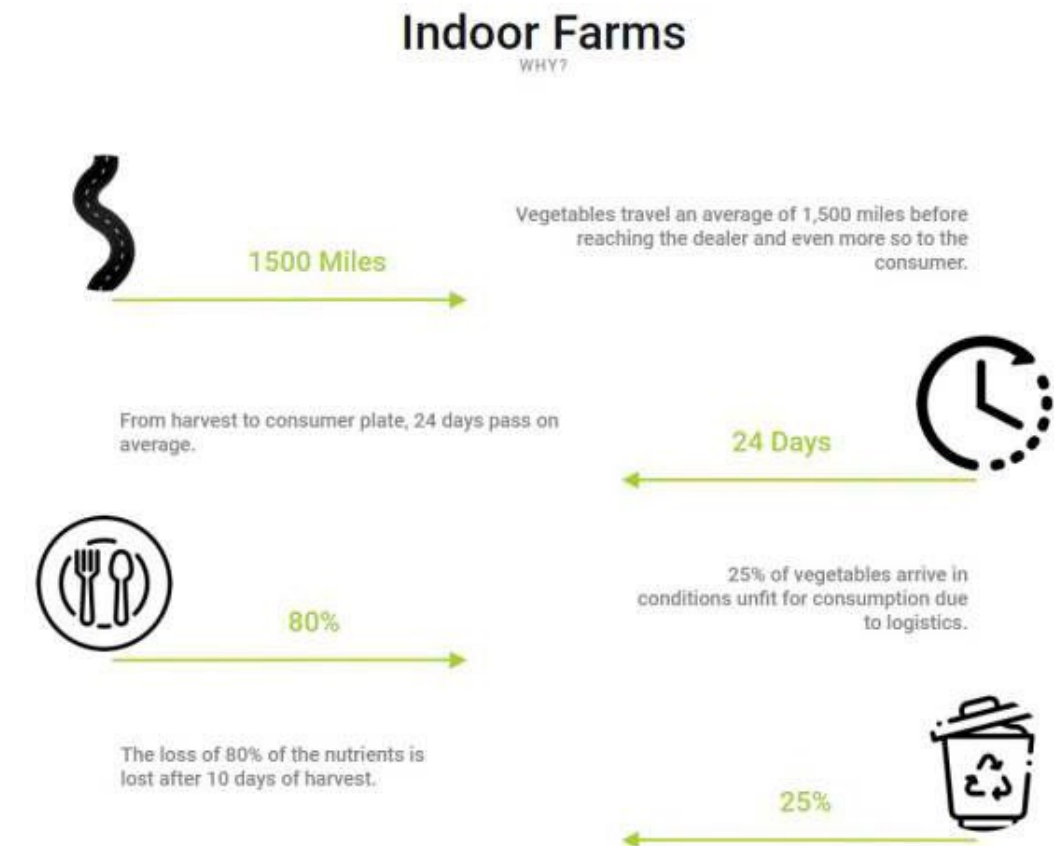
- **Reducing the carbon footprint:** By growing food locally, you reduce carbon dioxide emissions that occur in the transport and storage of food products.
- **Efficient use of water:** cultivation systems in controlled environments allow for more efficient water management, reducing its use and avoiding waste.
- **Pesticide Control:** Growing in controlled environments allows for the use of sustainable agricultural techniques, such as biological control of pests and diseases, thus eliminating the need for pesticides.
- **Food safety:** cultivation in controlled environments allows monitoring and quality control of the food produced, ensuring that it is safe and healthy for human consumption.
- **Promotion of urban agriculture:** cultivation in controlled environments promotes urban agriculture, a sustainable practice that is beneficial for the environment and the health of people living in cities.

Reasons Why Urban Farming is the Future of Agriculture

As the human population grows, more people continue to starve worldwide. Whether its rural areas or urban cities, people are hungry everywhere.

According to a report by the U.S. Department of Agriculture, there has been a substantial increase in the number of people who are bound to survive in areas with limited access to grocery stores, supermarkets or other sources of healthy food.

Since the widespread awareness of global warming, it has become almost a necessity to move towards an ecofriendly living. Adopting urban farming is one step that you can take towards sustainable life.



**Point of Use Decentralized Delivery Atmospheric Water Generators
100% Independent of existing water resources**



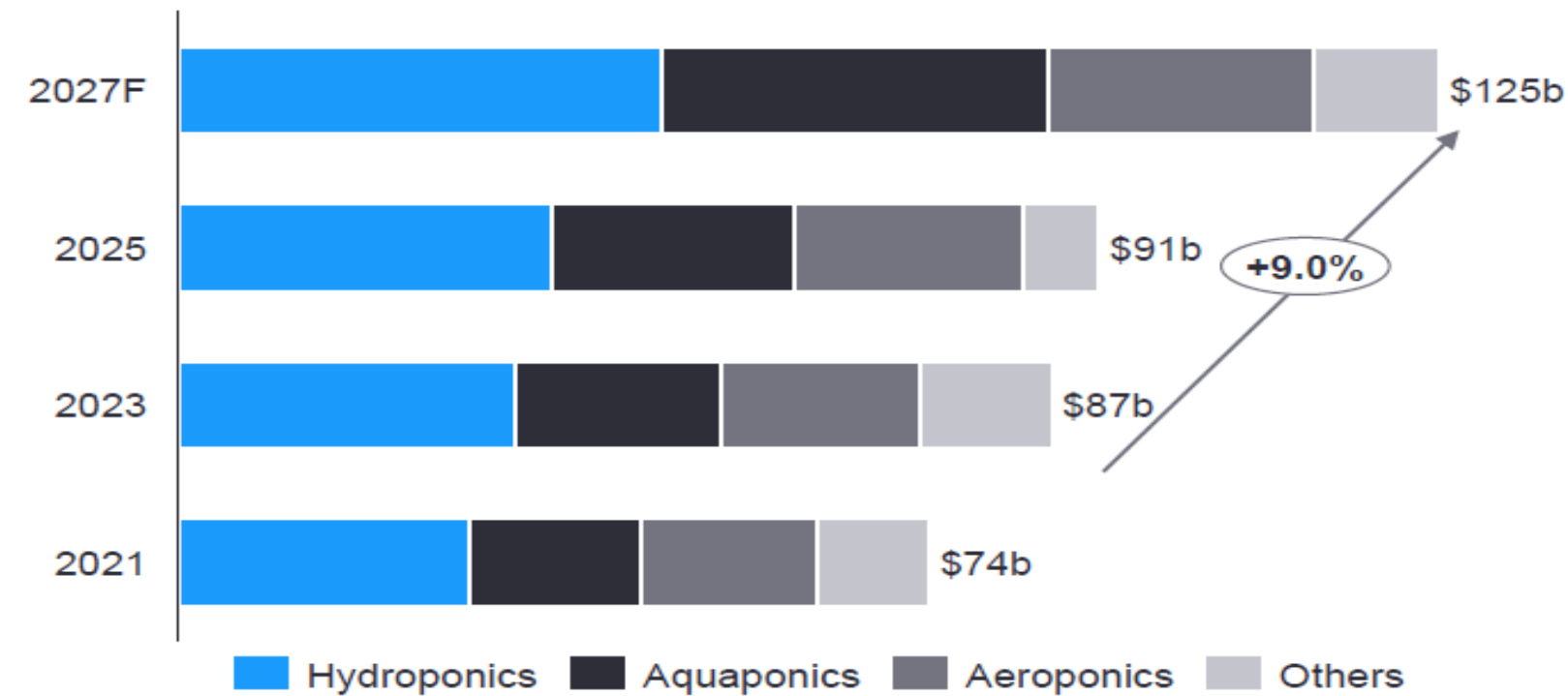
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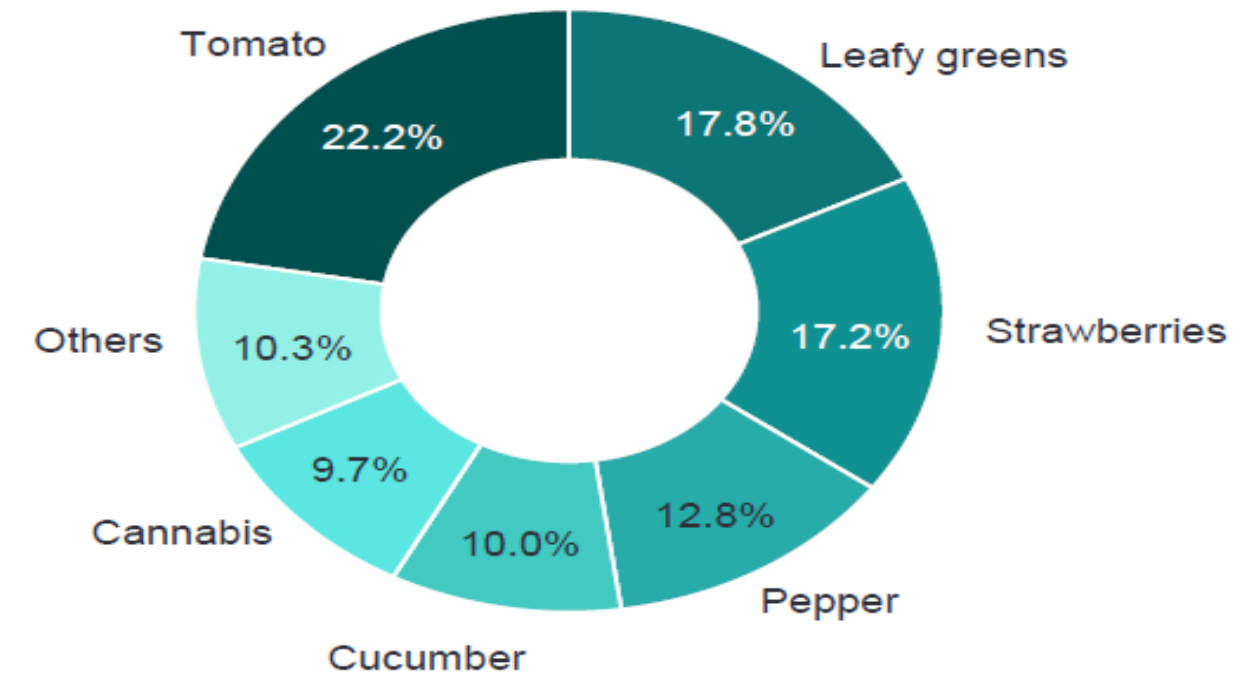
The global CEA market is anticipated to grow by ~9% between 2021-2027; the market has seen success in both leafy greens and fruits with recent growth in cannabis

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Global CEA market, by growing systems, 2021-27F (US\$b)



Global CEA market, by crop, 2021 (%)



- ▶ The most popular CEA growing system is hydroponics, followed by aquaponics and aeroponics.
- ▶ Tomatoes, leafy greens and strawberries make up over half of global CEA production.
 - ▶ Cannabis is becoming increasingly popular given it is a high-value crop and large returns can be reinvested in the business and CEA technology.
 - ▶ CEA producers face challenges growing cereal and row crops (e.g., corn, wheat, soybeans); these crops remain better suited for traditional ag.

Sources: Institute of Food Technologists, USDA Agricultural Research Service (ARS); Maximize Market Research, EY-Parthenon analysis.



URBAN FARM PROJECT PRELIMINARY SCOPE

Greenfield Hydroponics offers Project Scope, Definition, Pricing, Project Management, Installation Services, Implementation and On-Going Support to ensure a successful Urban Farm.

Whether you are reclaiming brownfields that can longer be used for any other purpose or are considering a Greenfield Greenhouse Project, our agriculture technology will meet your needs in an environmentally-friendly manner coupled with the scientific use of water-savings techniques employing drip irrigation and Atmospheric Water Generators that are 100% independent of existing and rapidly depleted groundwater resources.

Our synergistic grow systems that leverage state-of-the art hydroponic vertical grow towers, NFT Channels and ZipRacks enable 24 x 7 x 365 cycles that produce fresh, organic and tasty products grown specifically in close proximity to the market to mitigate costly freight charges, delays in delivery and reduction in spoilage.

Each Project is custom-designed to meet your crop selection requirements and budget.

Our professional design team has years of experience in AgTech that supports a multitude of varieties of crops as well as knowledge on organic growth techniques that employ nutrients that are healthy for both human and animal consumption.

Please contact our team to discuss your requirements.



Project Location: _____

Academic _____ **Commercial** _____ **Residential** _____ **Brownfield** _____

New Greenhouse _____ **Existing Building Structure** _____

Allocated Space to grow organic produce/flowers _____ **SF**

Crop Selection:

Name _____ **Anticipated Yield in lbs** _____

Name _____ **Anticipated Yield in lbs** _____

Name _____ **Anticipated Yield in lbs** _____

Business Purpose:

Off Take Agreement _____ **Wholesale** _____ **Retail** _____

Food Desert _____ **Restaurants** _____ **Non-Profits/Food Banks** _____

Knowledge of farming/agriculture **Yes** _____ **No** _____

Training Required **Yes** _____ **No** _____



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