

MOBILE ROBOTS

The next wave in vertical farm automation

Seasony 

Why Mobile Robots Can Outperform Conventional Automation



The Three Waves of Vertical Farm Automation

Vertical farming offers a promise of high yields in small spaces and year-round production, making it an increasingly popular solution for sustainable food production. However, the logistical costs associated with vertical farming, specifically the transportation of plants between multi-layered racks and stations, also known as "Cost of Access," can be a significant part of the operational expense of the farm.

Over the past decade, the way to handle logistics has evolved through 3 waves, mirroring developments seen in traditional warehouses.



Wave 1: Manual labor

In the early stages of vertical farming, manual labor was the dominant solution, necessitating a sizable workforce to handle the movement of plant trays. As vertical farms started to expand into higher-wage countries, this labor-intensive approach resulted in substantial expenses. In highly manual farms, labor costs can account for more than half of the total operational costs, rendering this approach unsustainable in the long run.

Wave 2: Conventional automation

The second wave of vertical farming emerged as investment and interest grew, leading to farms implementing capital-intensive, conventional automation systems such as elevators and conveyor belts to move plants around. However, as the economic landscape shifts and funds become scarcer, the industry faces the challenge of finding cost-effective alternatives for automation. This brings us to the third wave: Mobile Robotics.

Wave 3: Mobile robotics

Inspired by technology adopted in warehouses, mobile robotics offer a promising solution that marries the benefits of automation without the drawbacks of high upfront costs, over-dimensioning, and extended commission times. Unlike traditional systems reliant on expensive elevators and conveyors, mobile robots present a more efficient and flexible approach to transportation within the vertical farm.



About Seasony

Seasony is a robotics automation company based in Denmark. Our aim is to make indoor farms more scalable, profitable, and sustainable. Here's why and how we intend to achieve it.

CEA is a key part of the future of food

We believe Controlled Environment Agriculture (CEA) is a critical part of the solution to the challenges posed by global food and agricultural transformation. While it is not the only solution, it forms an integral part of a broader ecosystem of food technologies that will establish a long-term sustainable way of feeding the world's population.

CEA is rapidly moving towards an inflection point

We believe that CEA, in particular vertical farming, is moving towards a technical and commercial inflection point. Like renewable energy technologies such as solar and wind, these methods initially were considered expensive and niche but have now become not only commercially viable but superior. We believe CEA is on the same trajectory, and we want to help accelerate its transition.

CEA needs to find the right level of automation

We are advocates of semi-automation. Relying on labor for indoor growing is not only expensive – often people cannot be found to fill the jobs.. On the other hand, fully automated conventional systems are over-dimensioned and costly. They have long commission times, require large upfront investments, and take up a lot of floor space that could otherwise be used for growing. Drawing from the evolution of warehouse automation, we believe a blend of technology and human interaction will prevail in many use cases. This is the vision we aim to realize with our collaborative robot, Watney.



Watney - Autonomous Mobile Robot (AMR) Designed for Vertical Farming

Our flagship product, the autonomous mobile robot "Watney," automates core processes as well as unlocks valuable data insights for growers.

Autonomous transport

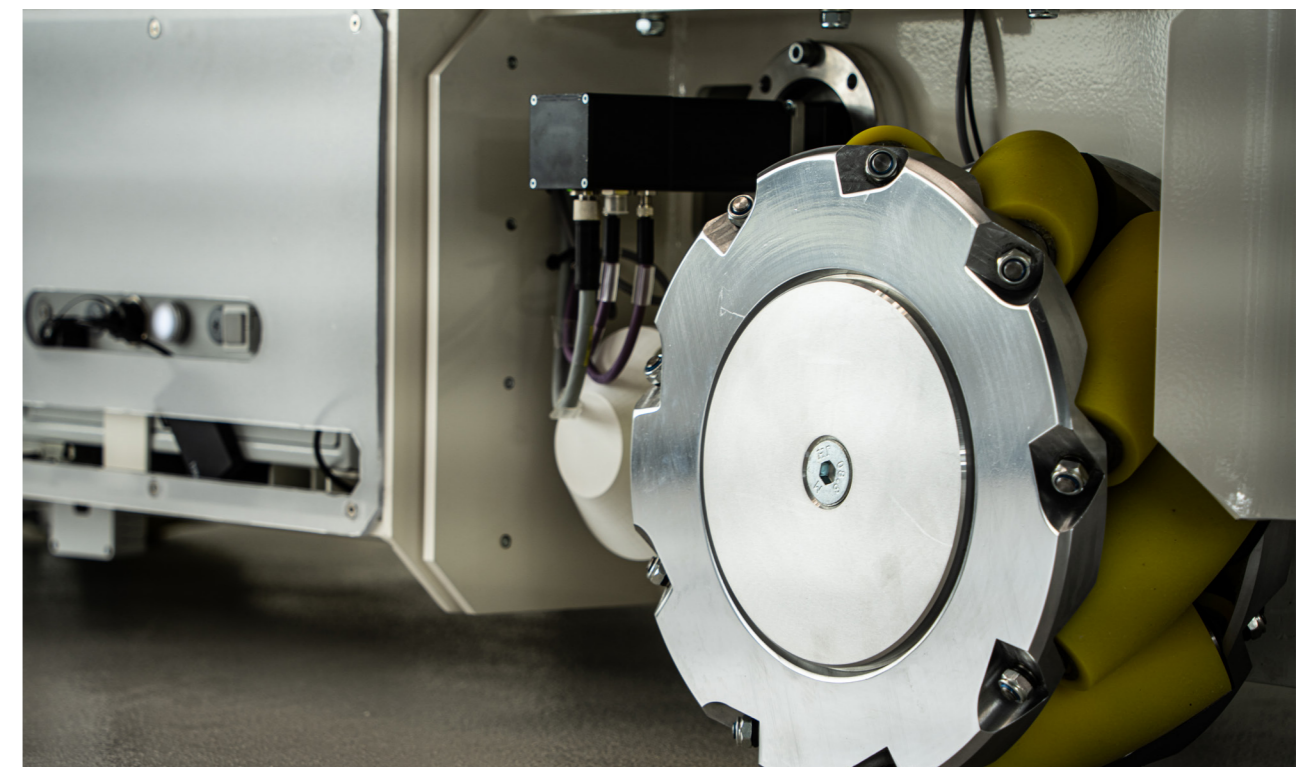
With a reach of up to 10 meters, Watney automates repetitive transportation tasks in cultivation rooms, reducing costs by up to 65% and eliminating the need for expensive scissor lifts or elevator systems to move trays and plants.

Granular data insights

Watney's on-board sensors and cameras empower growers to quickly identify issues and save time and money on crop walks and static sensors. Sensor data is presented through a detailed 3D climate map of the facility, while automated crop walks capture high-quality plant images, accessible through a digital gallery for documentation and analysis.

Open technology platform

Watney is an open platform for third-party technology, leveraging open standards and APIs. Our ecosystem of technology partners enables endless possibilities, including advanced analytics, specialized cameras, and harvesting solutions, all integrated into the same mobile robotics platform.





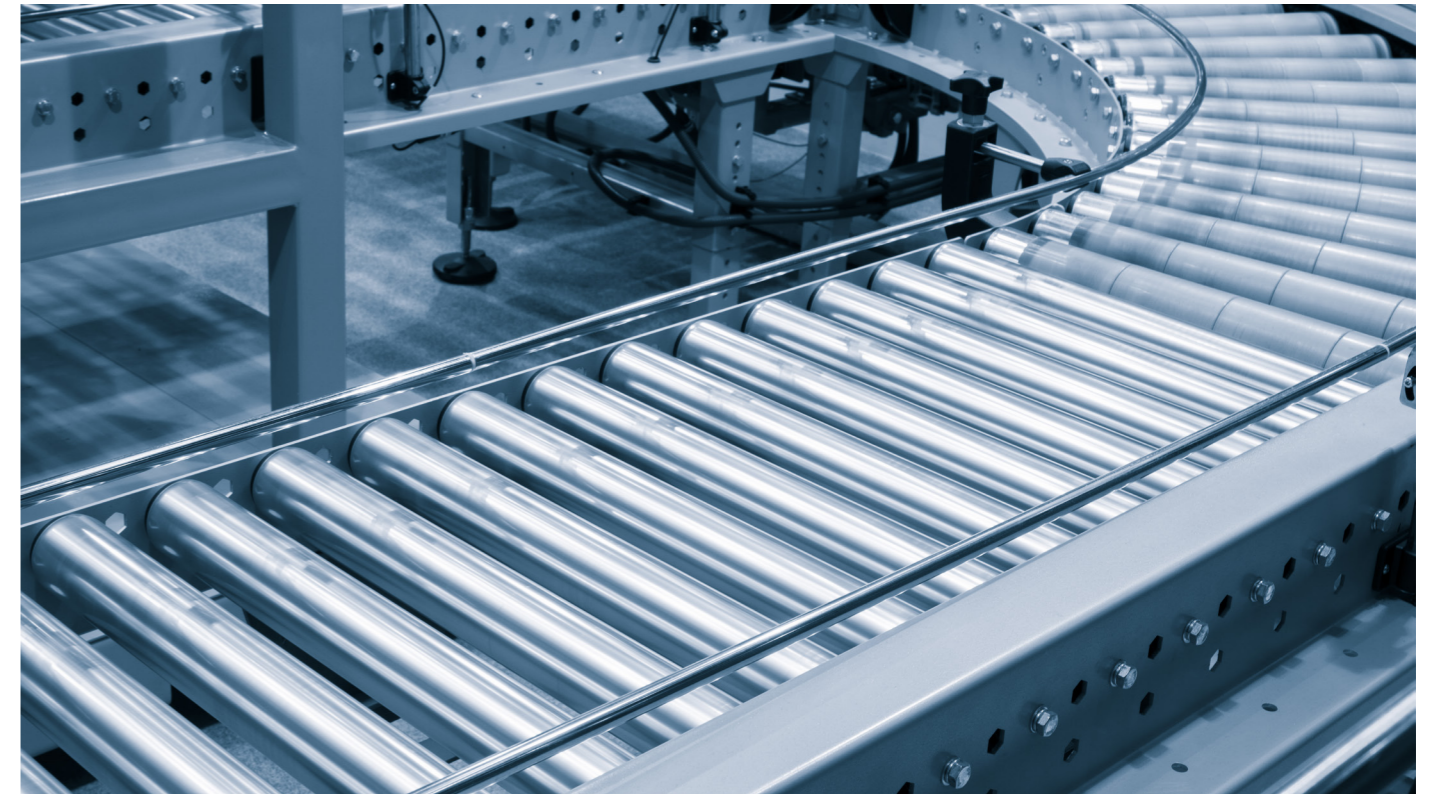
6 Reasons Why Mobile Robots Can Outperform Conventional Automation

Drastically Lower Upfront Investment

Conventional automation solutions, such as elevators and conveyors, often require a high initial investment. Building a fully automated system demands significant up-front capital that can be prohibitive to get started for new projects. In addition conventional automation systems often force new farms to commit to fixed infrastructure like elevators, rails, and conveyor belts. This rigid structure does not allow for scalability and can become an economic burden if it doesn't align with the farm's immediate needs.

Mobile robots offer a versatile alternative. By enabling farms to progressively add robotics capacity, they dramatically reduce the initial costs. Unlike fixed elevators or rails, mobile robots are adaptable, with a single robot being able to serve the entire farm. This flexible approach translates into a more economically viable solution.

At Seasony, we've taken it a step further by offering a Robotics-as-a-Service (RaaS) model. By converting the upfront capital expenditure into an operational expenditure model, we align costs with production and revenue. This allows customers to make informed decisions and compare their ROI, making investment in automation solutions more attractive and effective.



Shorter Commission Time

Conventional automation systems require a long time to design, tailor, and install. This process can take years from the initial plan to first seeding. This adds a critical dependency to the commissioning of a new site and can in worst case hinder the start of operations and risk technological obsolescence by the time the farm is up and running.

Mobile robots, on the other hand, provide flexibility and speed. Their adaptive nature allows orders to be placed closer to plant opening, reducing the risk of delays or misinvestments. The shortened time from order to delivery also ensures that farmers remain at the forefront of vertical farm automation, avoiding technology lock-in.

At Seasony, we prioritize efficiency with our core Watney robot. By offering a standard solution with customization opportunities, we ensure faster turn-around times, getting robots ready quickly to meet our customers' specific needs.



More Room to Grow

Conventional automation solutions like elevators consume valuable space in vertical farming. The high costs of buildings, systems, and climate control make it crucial to utilize every square meter for producing crops and generating revenue. The necessity to install large structures can limit the available area for growing crops, thereby reducing the overall output. Imagine, a 1.5m elevator installed on a 20m rack. That reduces the potential grow output by 5%.

Mobile robots allow a flexible and space efficient solution. By replacing elevators, conveyors, and rails, mobile robots free up considerable space and offer the flexibility to change the layout of the growing racks at a later stage. This dynamic approach not only increases the available area for crop production but also provides adaptability to adjust to changing needs, ensuring that the farm layout remains optimized for future growth.

At Seasony, we designed Watney to maximize space utilization. Utilizing a small footprint, advanced navigation technology and mecanum wheels, Watney can navigate even the tightest spaces in the vertical farm, preserving the precious square meterage for crop production.

Keep the Connection to Your Plants

Fully automated solutions can disrupt the human connection essential for growing crops. Plants are not steel beams or bottles of soda. Systems like closed growing towers or caged elevators may remove this critical feedback loop, impeding the ability to capture issues early and adjust operations accordingly.

Mobile robotics, by contrast, allow for easy access. Without automation equipment in the way the essential connection between human and plant remains unhindered.

At Seasony, we believe in semi-automation. Our approach emphasizes automating where needed, without losing the critical human touch. By promoting a close connection between humans and plants, we enhance the efficiency and quality of crop production.



Avoid Over Dimensioning

Conventional automation, while effective at moving large quantities, often leads to over-dimensioning in vertical farms. While a retail warehouse needs to move many thousands or even millions of items a day, that is not the case for vertical farms, that only move plants maybe 2-3 times during the entire plant life cycle. Even with the increasingly bigger farms, you simply do not need enormous amounts of transport capacity at the individual rack.

Mobile robotics offer a scalable solution. Having a mobile solution that moves around in the farm, enable the grower to scale to peak times without investing in more fixed installation of rails, belts and elevators.

At Seasony, we try to solve peak loads with process design. Although it might be more intuitive to invest in more equipment to handle peak transportation loads, we often find that rethinking processes can achieve the same goal. We work with our clients to explore different solutions to handle logistical needs, e.g., storage/buffer solutions, SOPs for floor staff etc.



Better Carbon Footprint

Traditional automation systems with their steel components come with a significant carbon footprint. Elevators, rails, and conveyer belts are often at odds with the sustainability goals of vertical farming, negatively impacting the environment.

Mobile robotics present an environmentally conscious alternative. Utilized throughout the day without long down-periods, they offer a green solution that aligns with the sustainable nature of vertical farming, supporting broader environmental goals.

At Seasony, we're committed to reducing our total carbon footprint. Through continuous measurement, benchmarking, and action plans, we actively work to reduce the environmental impact of our business.

Rethink Your Automation with 'Robotics-as-a-Service'

The last 12-18 months have fundamentally changed the economic environment vertical farms must operate in. Rapidly rising inflation and increasing interest rates have hit the industry hard and left many current and new farms struggling. Despite its large potential, vertical farming remains an emergent technology, still finding the right formula for profitability and scalability.

At Seasony, we're taking a different path. Watney is offered in a 'Robotics-as-a-service' model. For a yearly fee growers get the automation they need without up-front investments, expensive service agreements or unnecessary buy-in. We believe farms should have access to a highly flexible and easy to compare automation solution for their farms. "I can hire 5 people or license 1 robot"



Below are three key economic factors that impact the operations and profitability of vertical farms, and why farms can benefit from looking at OPEX-based automation using mobile robotics.

1: Immediate cost relief amidst rising energy prices

The abrupt increase in energy costs left many vertical farming operations challenged, almost overnight. To counteract the added operational costs, farms are forced to explore short-term cost saving solutions – such as automation of laborious tasks.

Watney can integrate with your existing systems, offering immediate cost benefits without the need for extensive redesign. The goal is simple: automation that yields rapid ROI without a prolonged design and commission period.

2: Reduce capital need in high interest rate environment

High interest rates make capital more expensive, making it challenging for farms to invest in traditional CAPEX-heavy automation solutions. Vertical farms already must raise large amounts of up-front capital for land, building and core cultivation technology. Adding a large up-front investment in automation systems, makes a tough capital market even tougher to overcome.

Watney's OPEX-based model allows you to align automation expenses with production output. This makes scaling up—or down—a lot less daunting and frees you from long-term capital commitments.

3: Counter wage pressure with flexible and scalable automation

With inflation set to remain high, wage pressures are inevitable. As wages rise the case for automation improves, also for more marginal labor tasks that were previously outside the scope of robotics automation.

Watney offers a flexible automation solution that can automate tasks across the entire farm, ensuring that even marginal labor tasks can be handled efficiently.

Want to Know More?

In conclusion, mobile robotics promise a transformation for the vertical farming industry when it comes to logistics automation. This technology challenges the status quo, combining financial viability, operational efficiency, and environmental responsibility, thus providing an advanced alternative to traditional automation systems.

As the economic landscape evolves, so must the approaches to vertical farming. The uncertainties of rising inflation, fluctuating interest rates, and wage pressures necessitate flexible and economically sustainable solutions. By providing immediate cost relief, reducing capital needs, and offering scalable automation, Watney enables vertical farms to navigate these tumultuous economic waters.

As vertical farms continue to proliferate and evolve, embracing mobile robotics could be a game-changer for your operation. At Seasony, we are committed to partnering with you on this journey, leveraging our expertise to help you navigate this new wave in vertical farm automation.

If you're intrigued by the prospects that mobile robotics could unlock for your farm and would like to learn more, we encourage you to reach out. We are here to assist you in understanding how this emerging technology can be integrated into your existing setup, or how it can form the backbone of your new venture.

Feel free to contact us for more information or to schedule a consultation. We would be thrilled to share our knowledge and passion with you as we shape the future of vertical farming together.

Read more:

www.Seasony.io

Linkedin: [Seasonycph](#)

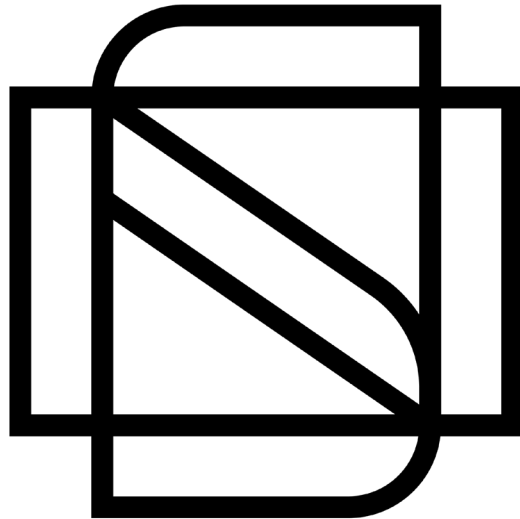
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