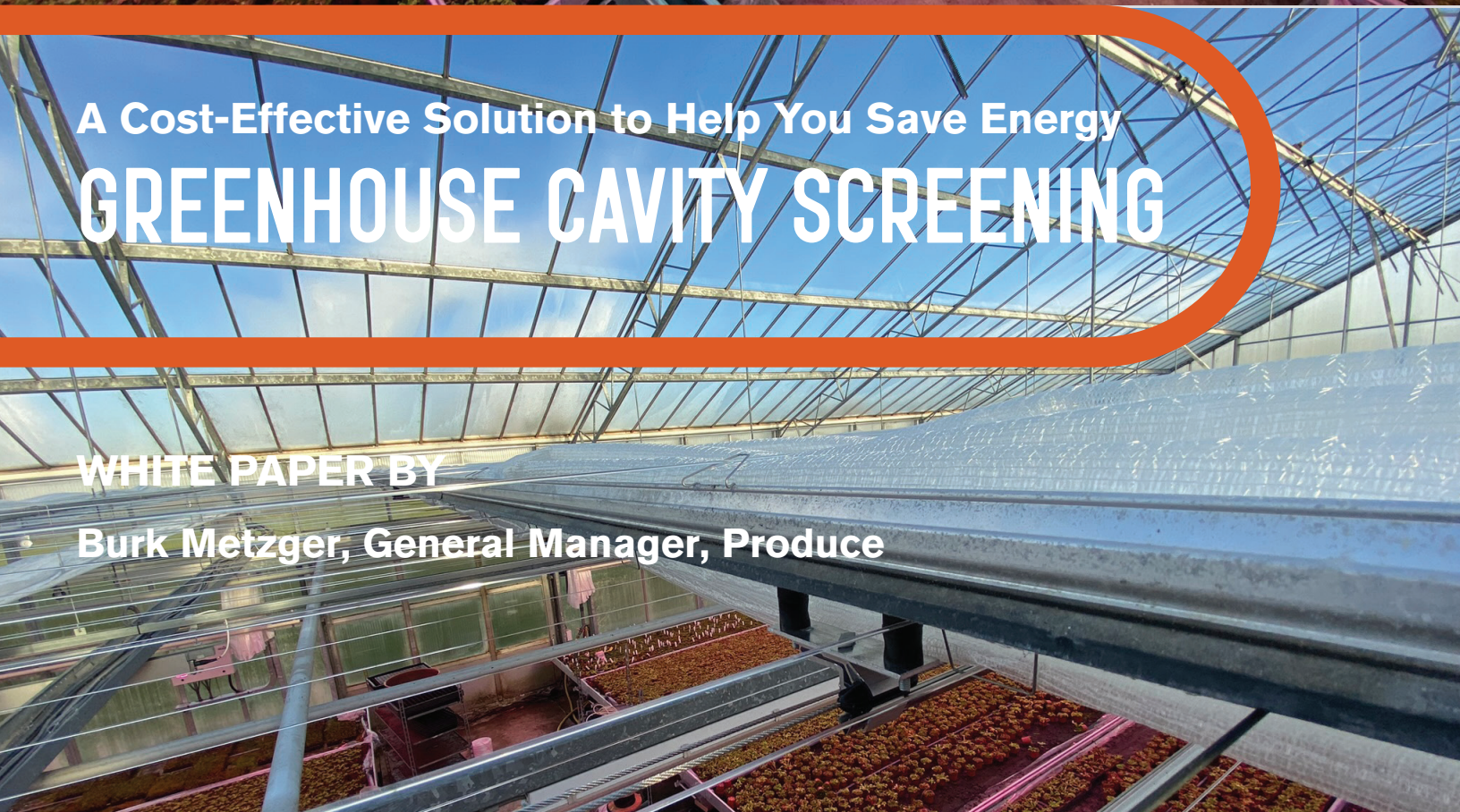
PROSPIANT

A Cost-Effective Solution to Help You Save Energy

GREENHOUSE CAVITY SCREENING



WHITE PAPER BY

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CONTENTS

TABLE OF CONTENTS

LEARN MORE

SUMMARY

Commercial greenhouse growers are under immense pressure as they grapple with mounting energy costs for heat and lighting that can account for more than 40% of their total operating expenses, significantly impacting their bottom line. With the ongoing fluctuations in energy costs and narrowing profit margins, the search for cost-effective and energy-saving solutions has become increasingly urgent for growers.

Commercial greenhouse operations in Europe have already felt the sting of record gas and energy prices, and North American growers are beginning to relate to their plight. To curb energy expenses, growers face difficult decisions ranging from suspending cultivation or delaying the start of the growing season to reducing employee hours and cranking down the thermostat. None of these solutions are satisfactory.

Energy efficiency and reducing carbon emissions are closely linked. Growing operations can reduce their demand for fossil fuels such as oil and natural gas, the primary sources of carbon emissions, by using energy more efficiently. This is turn, reduces their carbon footprint, and helps mitigate the negative impacts of climate change and environmental degradation. Overall, reducing carbon emissions and improving energy efficiency are not only important for the health of our planet, but they also make good business sense by appealing to a growing consumer base that values sustainability.

At Prospiant, we understand the importance of promoting energy-efficient solutions to help growers reduce their energy consumption in the greenhouse. One practical and cost-effective approach is the use of dual greenhouse screens operated by a single drive system, also known as cavity screening. In this whitepaper, we highlight the advantages and applications of cavity screens, as well as the positive environmental impacts they can have on the greenhouse. By investing in such energy-saving measures, growers can not only lower their energy bills but also contribute to a more sustainable future.

What Is Cavity Screening?

A cavity screening system consists of two screens that operate on the same drive installation, with a narrow gap, or cavity, between them. This innovative design leverages the insulating properties of the trapped air pocket between the screens to deliver energy savings comparable to those achieved by traditional double screen systems that require two drive systems. The two screen layers share the upper and lower nylon wire bed to prevent the cloth from sagging or billowing up in windy conditions.The dual screens nest tightly against the greenhouse truss when open to prevent any unwanted crop shading. By reducing heat loss in colder weather and helping to retain humidity, the system helps optimize the greenhouse environment while conserving energy.

Prospiant can retrofit a greenhouse with a cavity screening system using its existing drive system or install it in a new structure. The process takes an average of three weeks, depending on the scope of the project, the structures involved, and grower requirements.

Why Cavity Screening is Worth Your Attention

Looking for a way to improve the efficiency and profitability of your growing operation? Cavity screening might be just the solution you need. This innovative technology is not only cost-effective, but it also offers a wide range of benefits that make it a smart investment for growers of any size.

Reduce Heating Costs. A cavity screening system reduces the amount of energy required to heat a greenhouse by improving heat retention. This can lead to significant savings on energy bills, especially during the winter months in Northern climates.

HOW MUCH CAN YOU SAVE ON ENERGY COSTS?

Up to 75%

Savings in energy costs are possible with the addition of cavity screening to a greenhouse that relies solely on a heating system and has no energy saving screening

Up to 25%

Savings in energy costs a greenhouse with an existing single energy-saving screen can realize by retrofitting with a second energy curtain

**Energy savings vary based on grower location, crops grown, condition and type of greenhouse, and other factors*

Optimize Crop Yields. Overall crop yields and profits can be negatively impacted when growers are forced to either delay or shorten the growing season due to high energy costs. Many growers already have a single layer of energy screens in place. The addition of cavity screening allows them to maintain profitability during colder months and gain a competitive edge by starting production earlier. Lower heating pipe temperatures during cold weather will help retain humidity and keep root/substrate temperatures at a preferred level.

Save the Environment. Greenhouses commonly use fossil fuels as a source of heating. However, implementing cavity screening can significantly reduce the amount of heat required from greenhouse heating systems, resulting in a reduced carbon footprint and an improved environmental footprint.

Minimize drip damage. Condensation buildup on the inside of greenhouse glazing is a common issue, particularly in greenhouses with inadequate air circulation, high relative humidity, or ineffective anti-condensation coating treatments. When excess moisture drips onto crops, it can result in the spread of fungal diseases like gray mold (***Botrytis cinerea***) and the transfer of plant pathogens from one plant to another.

The addition of cavity screening insulates the inside layer of the greenhouse, helping to balance temperature and humidity differences between the inside and outside air when the screening is closed. This in turn, helps prevent condensation buildup.

Enjoy Quick, Hassle-Free Installation. Retrofitting an existing single-screen installation with a second curtain layer of cavity screening is a straightforward process as the cavity screen uses the existing drive system. Installation is typically quick and easy and causes minimal disruption to the greenhouse cultivation process.

Light Abatement. Cavity screening installed on the same drive system leaves growers with an option to install a light abatement screen on a second drive system against the unused cord of the truss.

FREQUENTLY ASKED QUESTIONS

Which growers benefit most from cavity screening?

Heating costs are a significant expense for many growers, especially those in colder growing zones where crops require heat to thrive. Cavity screening can help alleviate heating costs for those producing high energy-input crops such as peppers, cucumbers, and tomatoes. It is also a great option for greenhouses that don't have room for a second screen and drive system or where growers are looking to maximize truss space.

Ornamental growers also face increased energy consumption during the late winter to spring period when they produce much of their garden and bedding plants. Additionally, it's crucial for crops to arrive on store shelves at the optimal time to maximize sales opportunities during busy seasons. These growers are looking for ways to make their greenhouses more efficient, and cavity screening is one solution that can help. Even small gains in efficiency can make a significant impact.

What is the return on investment?

The length of time required to recoup an investment in a cavity screening system is determined by the current energy and the realized energy savings. Higher energy prices and increased energy savings will shorten the payback period. In the long-term, transitioning to a low-carbon economy powered by renewable energy sources such as wind, solar, and hydro is essential for achieving sustainability. In this context, investing in cavity screening to reduce energy consumption can be viewed as an investment in a sustainable future.

Example* of USD Costs Per Square Meter for a Full Cavity Screen Install

Material	1 acre cost/m^2	10 acres cost/m^2
Blackout curtain	28.19	17.31
Energy curtain	24.06	13.50
Shade curtain	25.19	14.56
Cavity Screen Retrofit, add 1 layer	8.58	5.28
Simple ROI in years	**3.81**	**2.34**

** Assuming Natural Gas consumption of 1.5GJ/m^2/yr @$6/GJ at burnertip and 25% savings*

WHY CHOOSE PROSPIANT?

In today's rapidly evolving market, greenhouse growers face tougher challenges than ever before. With increased competition and the unpredictable effects of climate change, it can be difficult to keep up. By embracing innovative technologies like cavity screens, businesses can stay ahead of the curve and overcome these obstacles.

To truly thrive, however, it's important to partner with a solutions provider that understands the unique needs of your business. That's where Prospiant comes in. Prospiant is the only North America-based full-service provider, operating in the U.S. and Canada, with in-house capabilities to design, build, engineer, manufacture, and install greenhouses and growing equipment. With our multi-disciplinary expertise and commitment to your success, we'll work with you to future-proof your operation and help you reach your full potential. Don't let the challenges of today hold you back – let us help you grow!

MEET THE EXPERT

Burk brings 25 years of European and Americas greenhouse industry and growing experience. As General Manager, he is the leading internal expert on growing operations and technologies for the Produce business. His expertise together adds world-class value to all projects by closely engaging with all stakeholders, maintaining project oversight and assuring a quality project. Burk consults with customers on greenhouse options, technologies, and integration. He can be on site/s weekly to provide project oversight, quality assurance, and ensure smooth delivery.

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