



# Case study LED4CROPS at STC

Location  
Philips Lighting

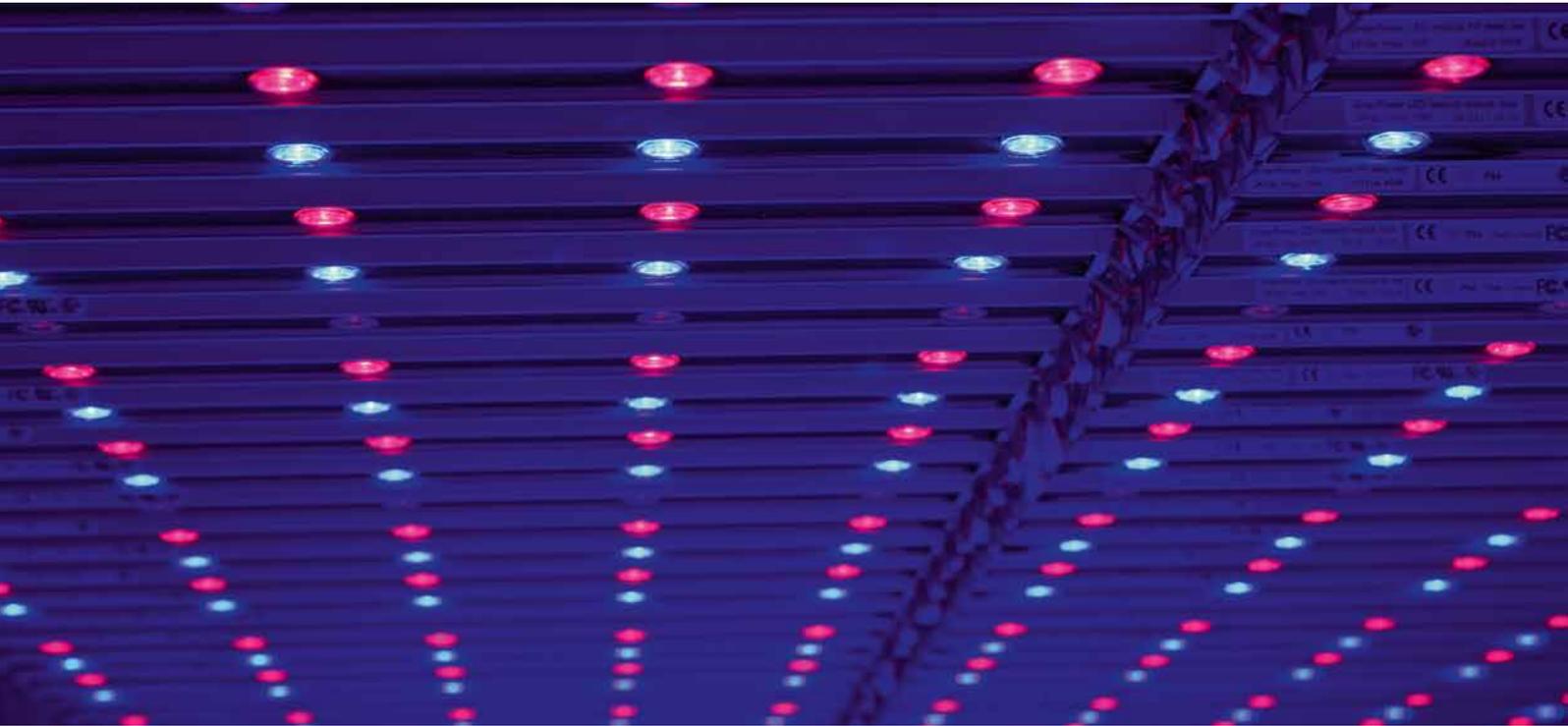
Yorkshire, UK  
Philips GreenPower LED production module  
and Philips GreenPower LED research module



**PHILIPS**  
sense and simplicity



“It opens the door to the concept of urban farming. You can grow crops in multi-storey warehouses, close to point of consumption.”



## Background

A number of factors are driving significant change in the world of food production. These include population growth and urbanization, climate change, rising energy prices, and the availability of land and water. The idea of 'sustainable intensification' is a relatively simple concept aimed at maximizing production efficiency in terms of external resource input on the smallest necessary land area. LED technology can make a decisive contribution toward this goal. The STC board has committed to investing in the development of an applied R&D facility, LED4CROPS, in partnership with Philips Lighting and Cambridge-HOK. The primary aim is to deliver applied research and technology transfer to growers, to develop and run an applied R&D facility for multilayer cropping using LED lights.

## The challenge

The ultimate vision or goal is the creation of a new breed of entrepreneurial growers keen to develop vertical farms in

the urban environment both in the UK and overseas where environmental and social challenges are perhaps even more acute. STC anticipates that there remains considerable scope for further advances in LED and PV technology in the future which will further enhance the potential of the technology. This technology will bring a much more environmentally-friendly and cost effective way of providing fresh food for urban areas. The horizontal developed technologies can be made available to industrial and agricultural users.

## The solution

The new LED4CROPS facility is housed within a 200m<sup>2</sup> building and has over 40 benches with LED lights in a multi-tier array. This all to enable light spectrum adjustment and flexibility, for growing a range of low level crops such as herbs, leafy salads, flowers, strawberries and plants in propagation. The facilities are divided into three primary areas: 1) 100% research modules in order to explore light recipes; 2) a semi-

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flexible space containing both research (FR) and production modules (DRB); and 3) an urban farming section fitted with production modules (DRB). There is a similar sized glasshouse alongside for comparison trialing. In addition, there is a smaller experimental area dedicated to look at novel approaches to the use of LED lights in the horticultural sector. CambridgeHOK, certified UK partner for Philips Lighting, constructed and monitored all the installation and control equipment for the LED lights. They also brought many years of experience to the design of the production equipment and structures. Tim Haworth, their general manager said 'We at CambridgeHOK are very excited to be involved in this project as we truly believe that LEDs will become another significant tool in the growers armory. For the first time we have the ability to offer growers practical technical solutions that have a direct impact on plant physiology, in ways that can be monitored and measured.

## Facts

### Grower

LED4CROPS at STC

### Sector

Research institute

### Crop

Multiple crops

### Location

Yorkshire, UK

### Solution

Philips LED GreenPower production module and

Philips LED GreenPower research module

### Philips LED Horti partner

CambridgeHOK

### Results

Applied research and technology transfer

## Benefits

As LED technology progresses, the potential benefits in terms of advancing vertical farming are tremendous. STC science director Dr Martin McPherson is enthusiastic: 'LED technology opens the door to the concept of urban farming. You can grow crops in multi-storey warehouses, close to point of consumption'. LEDs will offer growers great flexibility, he adds. 'You can schedule the crops. If you want to bring them on, you can do so. If you want to slow them down, you can reduce power.' According to his colleague, STC CEO Graham Ward, the prospects for growers are bright: 'A normal lettuce grower can produce five crops a year. With this system, we can grow fifteen'.



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