



# Carbon-LED

Carbon footprint reduction via LED based production systems

The use of assimilation lighting in greenhouse horticulture is increasing continuously driven by the market demand of year-round high quality products. The current revolution in LED technology creates a unique opportunity to realize highly efficient production systems based on LED light.

In the Carbon-LED project, we will realize a low-carbon LED based production system which will reduce the carbon footprint by up to 45% compared to systems using conventional High Pressure Sodium lamps.



Climate-KIC

Climate-KIC is supported by the  
EIT, a body of the European Union





# Climate impact

Carbon-LED project will contribute to a significant climate impact within the greenhouse horticultural sector by realizing, demonstrating and driving adoption of a new highly efficient production system.

The current CO<sub>2</sub> emission of the sector amounts to 20 Mton/year in Europe. A full transition from traditional lighting, now used in about 30% of the greenhouses, to LED-based production systems could save up to 3 Mton of CO<sub>2</sub> per year. Identified key barriers to massive adoption are: conservatism and financial situation of the growers, economic viability and limited experimental evidence for LED based production systems in all addressable markets.

To overcome these barriers and achieve full conversion to LED lighting systems quickly, validation experiments need to be performed and the results have to be shared with growers.

## Methodology

State-of-the-art 3D crop models will be used to design the new production system, followed by demonstration trials to show that it is feasible to be used in practice, with scalable climate impact.

The commitment of the business partners Philips and Bayer Crop Science, in partnership with leading knowledge institutes like Wageningen UR and INRA, and StartLife, will drive market uptake of superior LED-based systems in greenhouse horticulture. Breakthrough energy-efficient LED systems, new crop varieties, plant modeling and knowledge transfer are combined and result in a new generation of LED-based growing systems. This generates new business for the horticulture related industries, new or existing SME's in the areas of implementation of LED systems, consultancy and advice to growers.

## Elements that will be addressed for the design and adoption of new LED based production system:

- new lamp types
- selection of tomato genotypes and
- design of the cultivation system
- strategies and plan for accelerated adoption of new production system



## About Climate-KIC

Climate-KIC is the EU's main climate innovation initiative. It is Europe's largest public-private innovation partnership focused on mitigating and adapting to climate change. Climate-KIC consists of companies, academic institutions and the public sector. The organisation has its headquarters in London, UK, and leverages its centres across Europe to support start-up companies, to bring together partners on innovation projects and to educate students to bring about a connected, creative transformation of knowledge and ideas into products and services that help mitigate and adapt to climate change.

Climate-KIC is one of the Knowledge and Innovation Communities (KICs) created in 2010 by the European Institute of Innovation and Technology (EIT), the EU body tasked with creating sustainable European growth while dealing with the global challenges of our time.

[www.climate-kic.org](http://www.climate-kic.org)