nextgen nano

Transparent solar cells in greenhouses

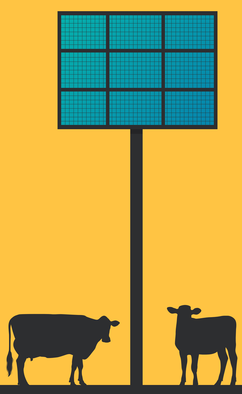
Recent research highlights the economic and environmental costs associated with greenhouse cultivation

- The University of Michigan claims energy usage is the **second largest operational expense** in commercial greenhouse crop cultivation.

- Cornell University says that despite greenhouses providing the controlled environments needed for innovative research, they are **very energy intensive and expensive to light, heat and cool**.

So, how can growers switch to sustainable, cost-effective greenhouse cultivation?

Reducing the industry's environmental impact



Agrivoltaics explores ways of incorporating solar cells into farmland **without sacrificing agriculture's arability**. Let's look at some of the progress:

- North Carolina State University manipulated the wavelengths of light passing through a greenhouse roof using semi-transparent organic photovoltaics (OPVs).

- They found no significant differences in the fresh weight and chlorophyll content of the lettuce grown under the organic cell filters across three harvest cycles.

- Research suggests that OPVs can fulfil the energy needs of the greenhouse, at no sacrifice to plant growth.

- These results provide an opportunity for further light and thermal management of the greenhouse through semi-transparent OPVs.

How do we achieve truly sustainable solar power?

Traditional solar cells are an **attractive alternative to fossil fuels**, but still have their drawbacks:

- Photovoltaics are composed using inorganic lead perovskites for their photoactive properties. Lead can be absorbed by plants and have means of entering the food chain.

- Organic photovoltaic (OPV) technology, like NextGen Nano's PolyPower®, are made from earth-friendly materials and have superior visible transparency and power conversion efficiency.

- OPVs could be applied as a semi-transparent thin glazing on the surface of a large-scale agricultural greenhouse

Find out more about NextGen Nano's organic photovoltaic technology at **www.nextgen-nano.co.uk**.