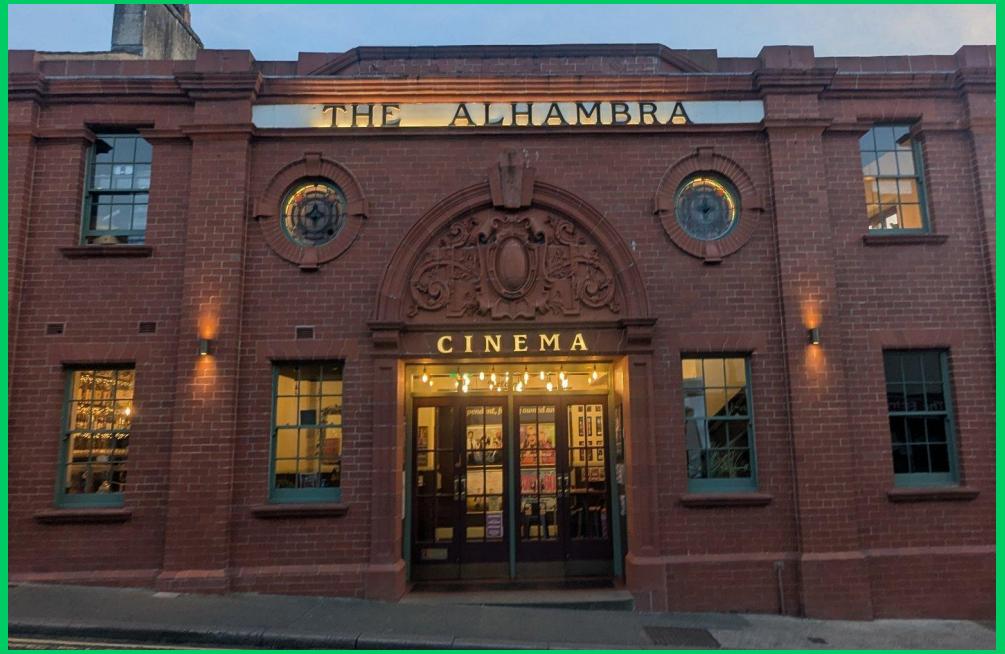
KESWICK ALHAMBRA



- Keswick, Cumbria
- Independent, family-owned cinema
- Heritage building - 1913
- 2 screens

‘GREEN’ CAPITAL PROJECTS

SOLAR PANELS AND BATTERY STORAGE

INSULATION

NEW GAS BOILER

PROJECTS AND FUNDING

Keswick Alhambra's 2021 refurbishment included investment in **energy-efficient ventilation with heat recovery**, a **new more efficient gas boiler** and **insulated underfloor pipework** - the latter proved particularly challenging in a heritage building. This was funded by **Culture Recovery Capex Funds.**

Solar panels and **battery storage** were installed in 2023. The array of 30 panels and the battery storage meet 30% of the cinema's energy demand.
Total investment in the solar panels and battery storage was £30,000 (excl. VAT). Almost 50% was covered by the **Lake District Foundation - Low Carbon Lake District Grant**, the remaining cost was covered by the cinema's own funds.

IDENTIFYING PRIORITIES

In preparation for 2021's building refurbishment project, an energy audit was conducted by **Cumbria Action for Sustainability** in 2020. This helped the cinema identify 'green' capital project priorities i.e.

- replacing external windows and doors to reduce heat loss and improve thermal performance of the building
- installing underfloor insulated pipework
- replacing the old gas boiler with a more new more efficient boiler

Following the refurbishment project, the cinema looked into renewable energy options. A heat pump was ruled out as the building wasn't well enough insulated for it to be effective. Solar panels were the next logical step and grant funding became available which made it a financially viable option for the cinema.

SOLAR PANELS

The solar panel installation comprises:

- 30 Longi Mono solar panels (1722 mm long x 1134 mm wide) which at its peak generates 405 watts, with a system generation of 12.15 kWh
- A Solax X3, 3 Phase Hybrid Inverter with 10kW capacity.
- Two Solax Lithium-Ion batteries with capacity of 5.8 kWh each. This capacity can be increased to a total of 22.3 kWh if 2 additional batteries are installed.

The solar panels have halved the carbon intensity of the cinema's electricity use, from 14kg to 7.5kg of carbon dioxide equivalent (CO_2e) per kilowatt hour (kWh), with an estimated annual reduction of 1.8 tonnes CO_2e per year.

CHALLENGES & ADVICE

The cinema remained open while the solar panels were being installed, but some screenings had to be cancelled during this time given the noise of the works. While this meant some lost income, it was preferable to closing the cinema altogether.

As the cinema doesnt have a smart meter, they are unable to get paid for excess energy exported to the grid, i.e. for electricity generated by the solar panels but not used by the cinema. Smart meters require good internet connectivity and WiFI, and this can be an issue in rural areas such as Keswick.