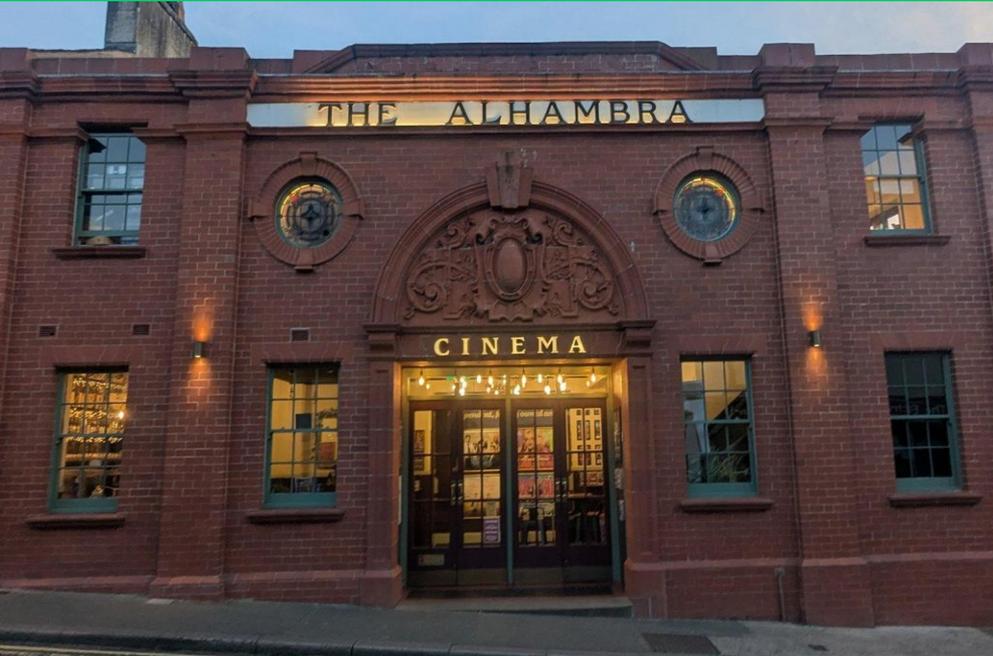




KESWICK ALHAMBRA



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

SUSTAINABLE IMPROVEMENTS:

SOLAR PANELS & BATTERY STORAGE

IMPROVED INSULATION

NEW GAS BOILER

PROJECTS & FUNDING

Keswick Alhambra's 2021 refurbishment including, **energy-efficient ventilation with heat recovery** unit, a **new gas boiler** and better **insulated underfloor pipework**. This was funded by **Culture Recovery Capex Funds**.

In 2023, a project to install solar panels and battery storage was completed. This included an array of 30 panels and battery storage which cover 30% of the cinema's energy demand. The 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 remainder of the cost was covered by the businesses own funds.

PRIORITIES & IMPROVEMENTS

- **2020** - In preparation for refurbishment of the building, an energy audit was conducted by **Cumbria Action for Sustainability**.

How were solar panels decided on?

- External windows and doors had been replaced.
- Insulation had been improved where feasible - this was a challenge in such an old building.
- A new gas boiler had been installed to replace a very old boiler. A heat pump was considered but it was determined that the building didn't have sufficient insulation for the effective use of a heat pump.

Solar panels were the next logical step and as a grant became available, this became a viable option.

SOLAR PANELS & IMPACT

Included in the solar panel arrangement is:

1. 30 Longi Mono solar panels with dimensions (L)1722 mm x (W)1134 mm. Power generation at peak is 405 watts, with a system generation of 12.15 kWhp
2. A Solax X3, 3 Phase Hybrid Inverter with 10kW capacity.
3. 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.

When the project was completed in February 2023, the system generated 33 kWh: the cinema's energy use was 39 kWh.

This meant there was a reduction in CO2 emissions from 14kg to 7.5kg.

It is estimated that the solar panel system should help reduce the CO2e output from 5.1 tonnes to 3.3 tonnes per annum.

CHALLENGES & ADVICE

The cinema remained open throughout the installation phase which meant there was some lost profit from the cancellation of screenings, due to the noise from the work. However, this was minimal compared to closing the cinema completely.

To export excess energy that is generated by the solar panels, a smart meter is required. This can be an issue in rural areas such as Keswick. The Alhambra do export excess energy but aren't currently paid for this as they don't have a smart meter.

