How we produce electricity / the components

Each solar panel is made up of cells, which convert the light energy from daylight into electrical energy. Daylight from the sun hits a negatively doped silicon layer which 'excites' electrons, effectively 'removing' them from their atoms. This creates a potential difference between the two layers of silicon and stimulates a flow of electrons. The flow generates Direct Current (DC) electricity.

Solar panels

Solar panels (or modules) are arranged in rows with wide margins to prevent shading. The panels have an anti-reflective coating and are fully recyclable made from silicon, silver and aluminium.

Mounting frames

Fixed-tilt frames: Panels are attached to mounting frames at a fixed angle.

Single axis trackers: The tracking system rotates the panels slowly from east to west.

Cabling

All cabling is weather proofed and securely attached to the structure or buried underground.

Inverters

Inverters convert the DC power into AC (Alternating Current) flowing on the local consumer's private network. Shown here are 'inverter cabinets' which house the equipment.

Transformer

From the inverters, the electricity flows to a transformer which 'steps-up' the voltage of the electricity to match that of the existing network.

Substation

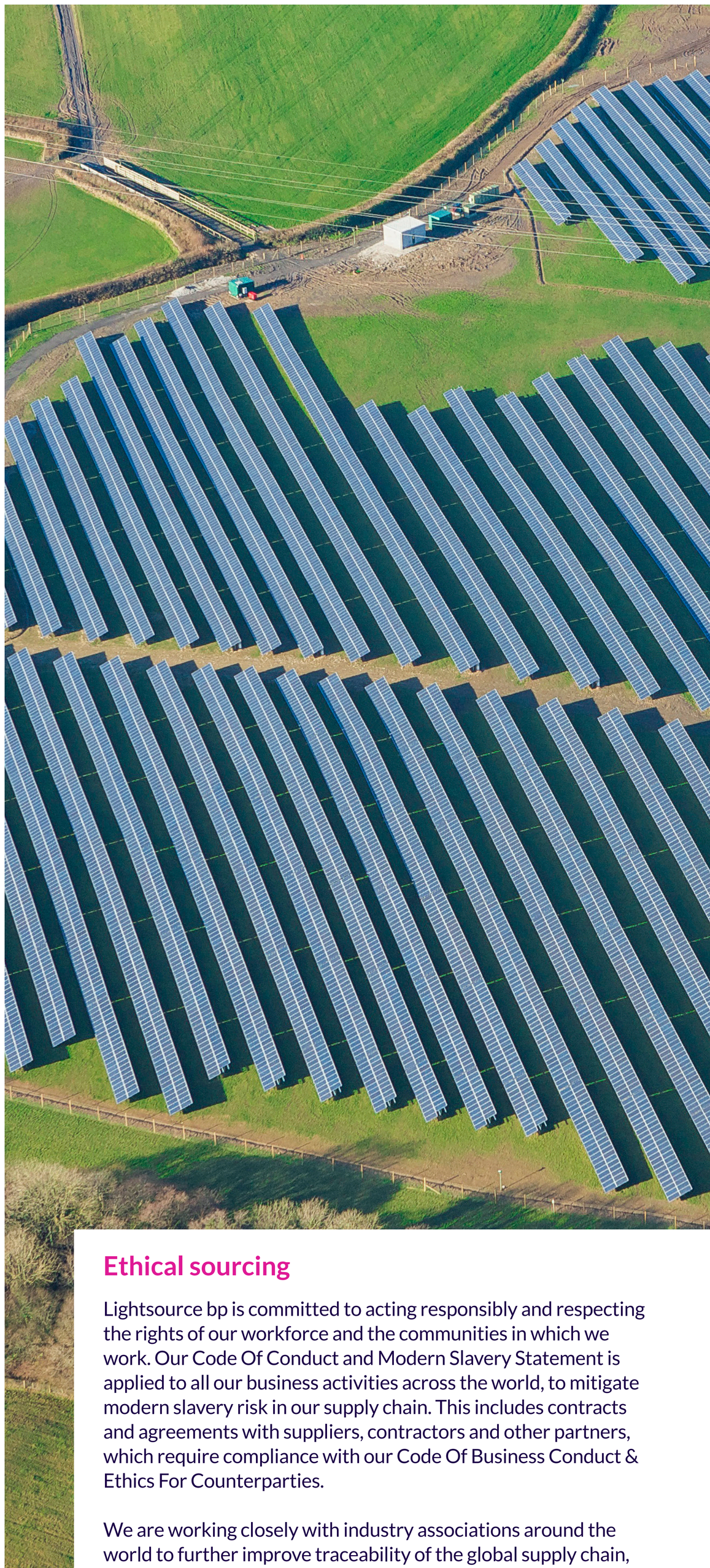
This is the on-site point of connection to the grid. From here, a high voltage cable buried underground, connects the solar farm to the existing overhead line grid network. The design of the substation will depend on the voltage and requirements of the network operator.

Security

Security measures including fences (c.2m), and CCTV cameras are installed and positioned to provide good coverage without impinging on local properties.

Ancillary infrastructure

A few smaller cabinet units are installed as monitoring houses for communications equipment and the storage of spares and equipment for our engineers.



Ethical sourcing

Lightsource bp is committed to acting responsibly and respecting the rights of our workforce and the communities in which we work. Our Code Of Conduct and Modern Slavery Statement is applied to all our business activities across the world, to mitigate modern slavery risk in our supply chain. This includes contracts and agreements with suppliers, contractors and other partners, which require compliance with our Code Of Business Conduct & Ethics For Counterparties.

We are working closely with industry associations around the world to further improve traceability of the global supply chain, and are committed to procuring panels with full traceability, to ensure they are ethically sourced.

What are our solar panels made of?

Glass & cells: Silicon (Si)

Silicon is the largest component on a solar farm, forming both the photovoltaic cells and the anti-reflective glass which protects them. To make the cells, sand is melted using electricity. It is then purified and distilled, formed into ‘wafers’ and given an anti-reflective silicon nitride coating to maximise light absorption.

Conductors: Silver (Ag)

The horizontal and vertical lines across the panels are screen-printed silver conductors. They conduct the electricity produced by the silicon cells to the cabling.

Framing & conductors: Aluminium (AI)

The panels are fixed onto an aluminium framework which quickly dulls to a non-shiny finish. The framework has galvanised screwed-in foundations, it is quick to install, very strong and can be removed easily to allow the ground to be fully restored once the plant is decommissioned.

Panel recycling

After a 40-year generation period solar farms can be decommissioned. Since January 2014, PV panels in the UK have been covered by the WEEE (Waste Electrical and Electronic) Regulations, which require recycling of the panels at the end of their operational life. Lightsource bp is a member of the PV Cycle UK take back scheme for this purpose. In addition, many of the other materials are recyclable or reusable, including the metal support frames and copper cabling.

Why so blue?

The cells making up the panel are coated in blue, as darker colours absorb more light, which helps the panels to work more efficiently. Whilst black cells would absorb more light, they would also heat up more rapidly, and solar technology works best at cooler temperatures. Blue is light absorbent, but maintains a cooler panel surface, so the panels generate electricity as efficiently as possible.

Bifacial panels

Bifacial modules have solar glass on both sides and no opaque backing. This allows both sides of the panel to generate electricity – the front side, which is oriented skyward receives direct daylight and the back side receives light reflected off the ground.