greencat Renewables

+ SOLAR SERVICES

DELIVERING RENEWABLE PROJECTS

+ ABOUT

Green Cat Renewables is a specialist renewable energy consultancy which was founded in Scotland in December 2004. In the 12+ years since Green Cat was established, the business has expanded to open four offices across Scotland and most recently established the Canadian arm of the business in Alberta, Canada.

Our experience profile includes the successful delivery of 600MW+ of wind, 200MW+ of solar and 25MW+ of hydro projects. We are proud to have played our part in delivering more community and locally owned projects than any other Scottish Company.

The company was established with an aim of driving down the costs associated with the development of renewable energy projects, identifying an opportunity to improve efficiency and reduce development costs by offering a complete in-house consultancy and project management service to deliver concepts through the whole project life-cycle from initial conception to operation.

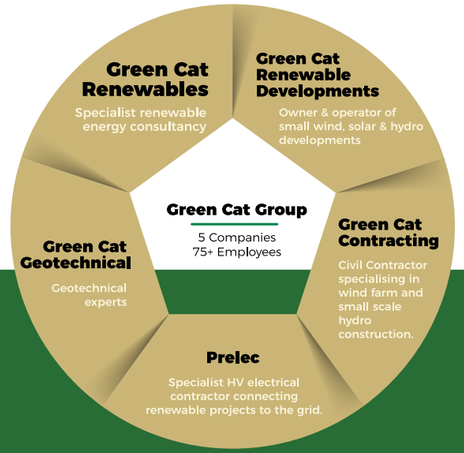
We believe renewable energy can be accessible to all. Our business was formed to support the development of smaller scale and locally owned renewable energy projects in as sustainable a way as possible.

OPERATIONS

Our client base encompasses community groups, agricultural businesses, high-energy users, developers, private investors, investment banks, lenders and utilities. With our depth of understanding of renewable energy projects, across a range of technologies, we are able to tailor our services to our Clients' needs and to a proportionate level of detail for the project.

Green Cat Renewables employs 50+ staff across five offices providing a diverse range of skills and experience. Our team includes engineers, environmental consultants, technicians, project managers, site managers and technical specialists. Our experts include energy yield modellers, grid modellers and geotechnical engineers. Green Cat's track record of successfully delivering over 400 projects demonstrates our team has hands-on experience in addressing technical challenges and finding solutions for a wide range of often complex environmental, technical and engineering constraints associated with the development of renewable energy projects.

Green Cat Renewables are part of the wider Green Cat Group, made up 5 companies providing specialist services to the renewable energy industry.



SOLAR CAPABILITIES

Green Cat has a wide portfolio of experience in the engineering, planning, design development, delivery and finance of ground-mounted solar farms and rooftop installations. Our in-house experts have supported our clients to successfully deliver a large portfolio of projects spanning over 200MWp of installed solar capacity across 35 projects.

Our capabilities include consenting, conditions discharge/management; solar resource assessment including whole of life forecasting; EPC and O&M contract procurement and technical negotiations; grid connection and scope interface management; construction management and supervision; PAC (Provisional Acceptance Certification) and FAC Review (Final Acceptance Certification; operational asset management, performance monitoring and fault diagnosis.

SOLAR EXPERIENCE

Green Cat has successfully managed the construction of solar farms ranging from 1MW to 14MW installed capacity. We have also delivered the planning consent for a 31MWp solar farm near Dundee, which is set to become the largest solar farm constructed in Scotland.

We have developed a great amount of experience of working with the major European EPC and O&M Contractors, as well as the major BNEF ranked module manufacturers. Working alongside developers, investors, and finance providers alike, Green Cat has a thorough understanding of the key technical barriers to the successful delivery and operation of a solar PV site.

DEVELOPMENT PROCESS FOR A SOLAR ENERGY PROJECT

STAGE 1:
SITE IDENTIFICATION
The first stage in developing a solar farm is finding a suitable site. Key requirements for a solar site include flat or gently sloping land, well screened and free from any obstructions that will cast a shadow on the site and in an area where there is a good solar resource available. Close proximity to grid infrastructure, or high demand users, is also key.

STAGE 2:
FEASIBILITY ASSESSMENT
Preparation of a preliminary site design is initiated to form the basis of an energy yield study. A grid feasibility study identifies any constraints in the local network,and possible environmental and technical constraints are mapped. Early consultation with regulatory authorities is undertaken to develop an appropriate scope of work for environmental and technical studies.

STAGE 4:
CONSENTING
Obtaining the necessary planning permits is a critical step in the development of any project. Once the site design and all necessary environmental studies have been completed, an application is then prepared and submitted to the consenting authority for approval.

STAGE 3:
DESIGN
At the design stage, the final site layout and installed capacity is confirmed. A grid connection application is then submitted based on the design. Geotechnical, environmental and technical challenges raised during Stage 1 are addressed, followed by a detailed resource analysis to confirm final site economics.

STAGE 5:
FINANCE & CONSTRUCTION
Funding discussion with various lenders and financial institutions commence. An Owner's Engineer is appointed to manage the EPC process, infrastructure construction, key operational and purchase agreements, grid connection and site commissioning.

STAGE 6:
COMMISSIONING & OPERATION
The completed project is connected to the local grid network (or a private connection is completed). Following completion of all necessary protection tests, the project is commissioned and renewable energy from the project is delivered to the electricity network. Operations & Maintenance (O&M) commence.

OUR SERVICES

Green Cat provides full life cycle development support to clients developing solar projects from initial site identification and feasibility, consenting and through to project construction and then onto ongoing operational support.

Our experience and in-depth knowledge allows us to add real value to your project, with in-house capabilities including:

- Producing bankable pre-construction and operational performance forecasts;
- Detailed grid analysis which allows us to carry out an assessment of network curtailment on generation, and evaluate shared grid connection options with second generators such as wind farms.
- In-depth technical knowledge of and experience in the negotiation of technical EPC and O&M contracts.

We see our customers as long term partners. In addition to trusting the quality of our service and our desire to see their project succeed we aim to continue to serve them through the whole project life and in many cases on into multiple future projects.

PROJECT LIFE CYCLE SUPPORT

Our multi-disciplinary team of engineers, environmental consultants, project managers and technical specialists ensure we can deliver expertise at every stage of a project lifecycle, including:

FEASIBILITY STUDY
- Initial Feasibility Study
- Preliminary Design
- Preliminary Energy Yield Study
- Grid Feasibility Study
- Constraints Mapping

CONSENTING & DESIGN
- Consenting
- Public engagement and consultation
- Site Layout Design
- Solar Resource Assessment & Energy Yield Analysis
- Grid Connection Application
- Geotechnical Investigation and Site Surveying

PROJECT DELIVERY
- Project Management
- Planning Conditions Discharge
- EPC Contract Procurement & Negotiation
- Construction Supervision & EPC Management
- Health & Safety Management
- Provision of Technical Advisor Services
- Management of Grid Connection

OPERATIONS & MAINTENANCE
- Operational Monitoring and Asset Management
- Performance Monitoring
- Fault Diagnosis Analysis

CASE STUDY: HOUSE O'HILL

TECHNOLOGY: WIND & SOLAR
TYPE: HYBRID CO-GENERATION PROJECT
CAPACITY: 4MW COMBINED CAPACITY

Green Cat provided all elements of consultancy and development support services for the House O'Hill co-generation project which was the first of its kind in Scotland. Green Cat developed the site from initial conception, consenting and build and continue to provide operational asset management for the site.

Three wind turbines were developed at the site and have been operational since 2010, the turbines are some of the best performing wind turbines in mainland UK with an average load factor in excess of 40%. A ground mounted solar PV array was later developed and added following a detailed study with the aim of balancing the export profile across the year utilising the existing grid connection capacity.

The construction of combined wind and solar generation at a site is advantageous to the developer providing a greater consistency of generation across the year, levelling out the natural peaks and troughs of the generation profile when these technologies are isolated. The combination of the generation profiles of wind and solar are a particularly good fit due to the generation peaks being in opposite seasons. This means that a grid connection for the full combined capacity is not necessary in most cases.

The export limit of the House O'Hill development is 2.4MW, however, the addition of solar has allowed for a total installed site capacity of 4MW. This has been calculated as the optimum scale of solar installation with the resource and curtailment analysis identifying a curtailment requirement of only 3%. Similar studies can be undertaken to match on-site demand with generation.

The co-location of wind and solar technologies has proven a success at this site, by optimising the grid connection infrastructure. It is considered that the addition of battery storage in the future would provide further optimisation and would virtually eliminate the issues around intermittency of wind and solar, ensuring the export from the overall scheme is constant, reliable and renewable.

CASE STUDY: SOUTHILL COMMUNITY

TECHNOLOGY: GROUND MOUNTED SOLAR
TYPE: LOCALLY OWNED COMMUNITY PROJECT
CAPACITY: 5MWp

Green Cat provided technical advisory services for the procurement of pre-construction finance for the project. With a dedicated team and established working relationships with funders and their legal advisors, financial close to pre-construction finance was achieved in just six weeks.

Green Cat undertook the full technical due diligence review scope including the overall technical site configuration including component bankability, consenting, environmental and site conditions, grid connection, energy yield, construction and operational contracts and technical review of finances.

Technical advice was also provided on the negotiation of technical contract terms, ensuring a competitive contract and minimising overall project CAPEX to the community.

Inspections were undertaken throughout construction, and in the small scale and community nature of the project, dedicated snagging visits were also completed on behalf of the funder and community group.

Southill Solar Park was successfully commissioned in November 2016 with Provisional Acceptance testing (PAC) ongoing through December 2016 into January 2017. A thorough review of data was undertaken to confirm the site is ready for commercial operation.

Following successful delivery of the technical due diligence review, Green Cat are now appointed to undertake ongoing operational monitoring and asset management for the site.

CASE STUDY: ROUNDPONDS

TECHNOLOGY: SOLAR
TYPE: LARGE SCALE
CAPACITY: 14MWp

Green Cat provided technical advisory services to the Developer for the construction delivery of a 14MWp solar farm. The project was commissioned successfully at the end of March 2015, and was funded on full recourse finance. Income for the project will be supplemented against the Renewable Obligation (ROC's) tariffs. Green Cat oversaw the construction execution, including management of EPC, ICP and DNO interfacing, as well as technical negotiation on behalf of the Developer on EPC and O&M contracts. The solar farm at Roundponds is expected to produce enough electricity to supply 4,242 homes annually.

CASE STUDY: TEALING

TECHNOLOGY: SOLAR
TYPE: LARGE SCALE
CAPACITY: 31MWp

At 31MWp, Tealing Solar Park is set to be the largest ground mounted solar PV array in Scotland when constructed. Green Cat were appointed as Environmental and Planning Consultants to secure planning consent for the developers. With a site area of approximately 126 acres, this major application had a number of environmental and technical issues to overcome, however, Green Cat successfully resolved these matters by working closely with the local community and the consenting authority. Community engagement was particularly important with this development due to a number of concerns of industrialisation of the area with the recent installation of a commercial scale wind turbine on the site and plans to expand the already large substation. The application has granted consent at the local Development Standards Committee with the backing of a large majority of the Councillors. Construction on this development is due to take place in the coming summer months.

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