



Generic Solar PV Profiling Proposal

BIPV, Car Parks, Canopies, Ground Mounted Systems

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Acronyms

ESCO, Energy Services Company

UK, United Kingdom

EU, European Union

CCL, Climate Change Levy

BIPV, Building Integrated Solar PV

FIT's, Feed In Tariffs

ROC's, Renewable Obligation Certificates

PPA's, Power Purchase Agreements

BOS, Balance of System Components

CAD, Computer Aided Design

DC, Direct Current

AC, Alternating Current



Taking the Guesswork Out of the Low Carbon Economy.

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1 ● Scope of Supply for Solar PV Profiling

Taking the Guesswork Out of the Low Carbon Economy

If you are looking to develop - or have started a sustainable energy project, BFC will help develop a strategy that combines financial and long term security of conventional and renewable energy supplies together with a significant level of Environmental Sustainability.

The project would look to build-in energy security over the longer term by investigating the deployment of renewable and proven, low carbon, efficient technologies.

Low Impact technology would be in keeping with the local environment and take the guesswork out of meeting or exceeding compliance or voluntary targets.

In general to be a sustainable energy project, BFC would follow a process called an Energy Hierarchy - Be Lean, Be Green, and Be Clean.

Use less Energy

Be **Lean**, this will minimise the demand for energy

Use Renewable Energy

Be **Green**, As much energy as possible should come from zero-carbon sources and natural energy flows, so climate change impact is reduced and natural resources conserved

Supply Energy Efficiently

Be **Clean**, where it is not practical to use renewable energy, the energy should be supplied as efficiently as possible



2. Understanding the Brief, Process and Client Aspirations

Process Overview

The client is looking to develop a State of the Art Sustainable Energy Low or Zero Carbon Project; the project will help develop a strategy that guarantees financial viability and long term security of conventional and renewable energy supplies, together with a significant level of eco-sustainability, setting the standard with a lower carbon footprint.

The site should look to become a model exemplar location for sustainable energy.

BFC propose the following overview of the process to deliver the project, following receipt of a hard copy client brief, submission of a concept proposal to Management, describing the brief in the context of an energy hierarchy.

A Kick Off meeting with management to discuss the proposal, strategy, objectives, key outputs, methodology, timescales, budgets and management reporting protocols. BFC to submit reports at a weekly management meeting.

The project will use project management software. Following agreement both parties to sign a Consultancy document.

Following agreement both parties to sign a Consultancy Agreement.



Understanding Client Aspirations

BFC understands the site would look to promote their establishment as a model for Sustainability.

BFC understand their brief would be to develop a Sustainable Energy and Carbon Reduction Solution from concept to approval stage by the Management team.

BFC assume client wishes to be compliant with current UK/EU targets and legislation together with options to meet future targets with enhanced energy security.

Other options listed below,

- Compliant with UK/EU CO² reduction targets to 2020, circa -20%
- Compliant with 2009 Climate Change Act, 80% CO² reduction targets 2050
- Carbon Neutral
- Carbon Positive (in credit)
- Other, please state preference
- Becoming an ESCO with Private Wire Distribution

The required study would focus on three areas that require short, medium and longer term action. The study would build on any previously commissioned baseline energy assessment metrics and existing carbon footprint data, key areas include.

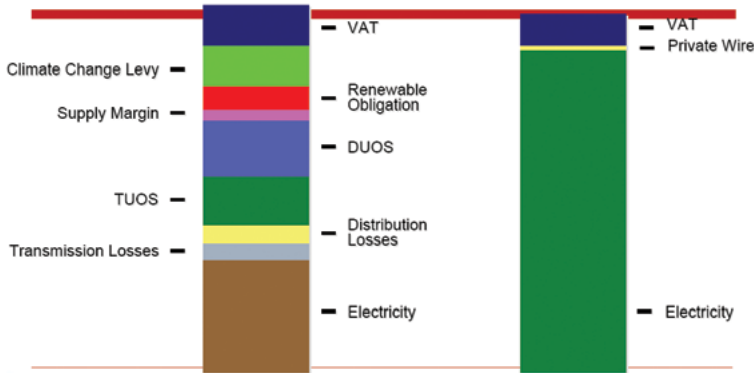
Baseline Assessment
of Carbon Footprint &
Current Energy Usage*

**Benchmark Site Survey
and Analysis**

Analysis,
Solar PV Energy Option

Present robust & scalable renewable energy options to meet UK/EU targets, maximise value of sustainable green kilowatt hours with no CCL levy, & opportunity for Private Wire Distribution, the difference between a brown and green kilowatt hour is shown above.

Grid Supply Price and Private Wire Supply Price



BFC design solutions promote self-consumption at the point of production, Green electricity consumed directly by the customer replicates the laws of physics since the electricity will always go the nearest load and save energy being imported from the National Grid. With UK grid losses around 8% BIPV or private wire systems have a greater potential for the energy generated to be used on site, so minimising grid losses and reducing pressures on the grid.

3. Sustainability Background to Deliver the Project

Combining Economic, Environmental and Social Concepts

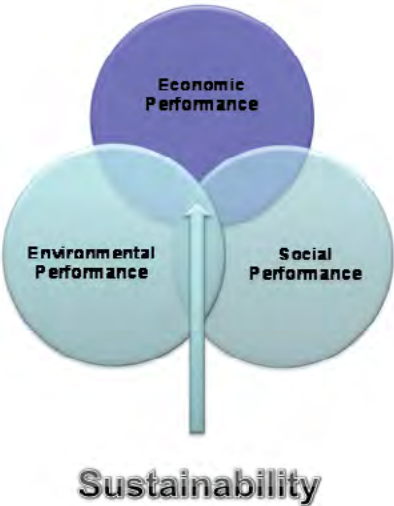
The proposal is based around the usage of a modern concept based on “eco-efficiency/eco-effectiveness”, and the triple bottom line combining the inter-related elements of ecology, economy and social context.

The goal will be to seek opportunity and optimise value in their relationship through a joint commitment to eco-effective low or zero carbon design

Ecological and Environmental Sustainability - How does this project relate to the natural systems and energy flows in the environment, will it promote and sustain healthy sustainable relationships, are there any negative by-products to the project for the local eco-system and wider biosphere

Economic Sustainability - Can this project be developed to offer commercial viability to the Site and their current business plan, the need for the site to realise some economic goals is recognised to be a possible driving force behind the project

Social Context - What is the effect of the project on the local, regional community, is it a fair and just use of resources



4. Key Deliverables for Solar PV Profiling

Typical Contents, Summary and Qualified Recommendations

The assumption has been made that BFC will have access to the sample site energy services with full access to historical energy bills and current contracts, client to advise/confirm scope of supply which in the event of an assignment would be built into the consultancy agreement. Any project would take into account any previous work carried out by 3rd parties*.

Summary

- Executive Summary
- Next Steps

Site Details

- Location Assessment
- Site Photographic Survey
- Site Access Protocols
- Visual Impact Assessment
- Site Modelling – Google Sketch Up
- Environmental Considerations
- Sustainability Considerations

System Summary

- Solar PV Modules and Kromatix™ Colour Glass Options
- Balance of System Components
- Grid Connection Protocols
- Architectural Considerations & Advanced Visualisations
- Re-Powering Options
- Energy Efficiency Options
- Retro-Fit, Re-Furb and New Build Options
- Optional, Professional HSE and Contract Review Service

Energy Production

- Electricity Generated – JRC GIS EU Standard
- Expected Losses in the System
- Energy Flows, Self-Consumption, Storage, Export

Financial Analysis

- Summary
- Feasibility Studies & Planning
- Funding Options, FIT's, ROC's, PPA's, other
- Capital Expense
- Operational Costs
- Expected Income, Payback Period

References & Sources of Information

- References
- Glossary of Terms

Comprehensive Digital Site Survey and Analysis of e-maps.



5. Technical Inputs for Solar PV profiling

Turning Ideas and Concepts into Reality

- Drawing's and dimensions of the space available for the PV system
- Details of obstacles which may produce shading
- Technical and Visual characteristics of the selected module(s)
- Accurate visualisation of the site using Sketch Up and optional photorealistic rendering software
- Site modelling to ensure optimal solar module usage and positioning
- Appropriate site digital photographs to approved specification and projections
- System Yield Estimation from JRC EU GIS standard or equivalent
- Summary of site access and HSE issues
- All relevant planning information if available

Creation of Digital 2D & 3D modelling used to calculate solar shading and position panels accordingly in order to achieve maximum unimpeded productivity.

BFC would as an optional second stage process, approach 5 leading PV companies for a budgetary “turnkey” quotation based on the above design information.



Next steps to complete the Visualisation & Site Plan

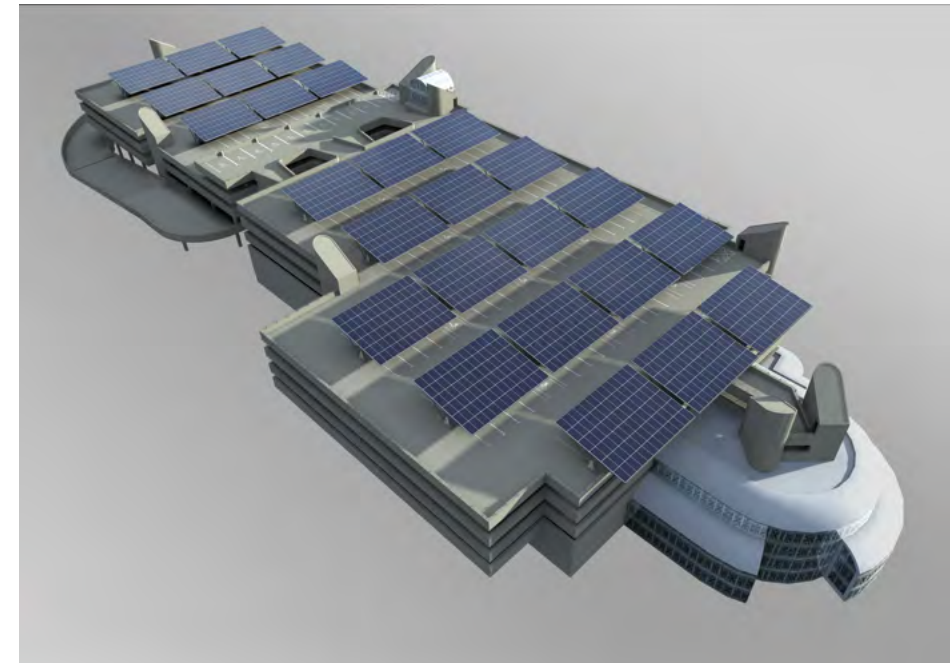
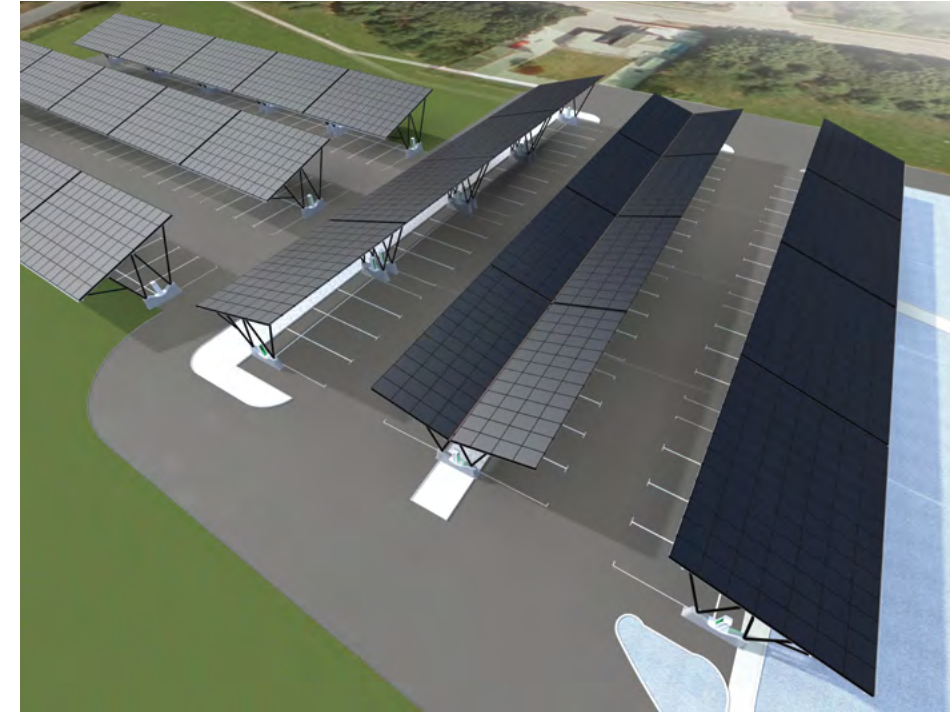


6. Technical Outputs for EPC's and Contractors

The successful Design Engineering team or nominated 3rd party contractor would be expected to provide the following information and design packages.

- Engineering documentation with CAD drawings in accordance with the design code
- Module, Inverter, BOS specification
- Distances, module to inverter, inverter to grid for cable selection and design
- Full cable cross section calculations, shading clearances and system yield estimation from a recognised industry source
- Full selection of DC and AC protection devices and system isolation components
- A design specification providing compliance to all applicable UK, EU standards
- A comprehensive Health and Safety File, and System Design Summary
- A comprehensive summary of applicable system and component warranties
- A comprehensive Operation and Maintenance Manual plus scheduled service programme
- System Yield estimation is expected to be provided from JRC EU GIS, software or equivalent state of the art PV industry software with full description of inputs and outputs based on probabilities, past performance, disclaimers and qualifications.
- Interface Documentation, Scope of Supply, Roles and Responsibilities Profile

Car Parks, Canopies and Ground Mount Systems





Terms & Conditions, Standard BFC Solutions Limited

BFC is an associate consultancy, who have held senior positions in the renewable, low carbon industry sector; we have extensive expert knowledge, practical experience and proven success in the European and Global marketplace

Thank you for considering BFC for your consultancy requirements, as you go through the facts, figures and deliverables bear in the mind the extraordinary level of service you will be enjoying with this leading organisation of 30 years' experience

BFC works quickly and efficiently, because we have low overheads, we are able to offer very competitive rates for professional services.

Bespoke Solutions, BFC offer expert consultancy, to develop sustainability and carbon reduction strategies, Energy Efficiency Usage, Carbon Footprint Analysis, Low Carbon Feasibility Studies & LZC Technology Selection

Standard Solutions, BFC also offer a full range of business services, Strategic and Tactical Marketing Planning, Market Research and Customer Feedback Analysis, Pre-Investment Due Diligence, CEO Leadership Mentoring, Framework & Policy Studies, Low Carbon Funding Reviews, International Business Development, Bid Proposals Management & General Marketing Services.

Consultancy Agreement and Terms & Conditions, in the event of a confirmed assignment this document would be signed by the Client & BFC Solutions Limited.

Fixed Assignment price, excluding expenses at cost and standard travel at HMCR levels, estimated assignment time, TBA, Quote

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Current Professional References Available on Request

BFC Solutions Limited, Registered Company Number 5392315

