BLP

butterfly

The tool that gives you control over green design

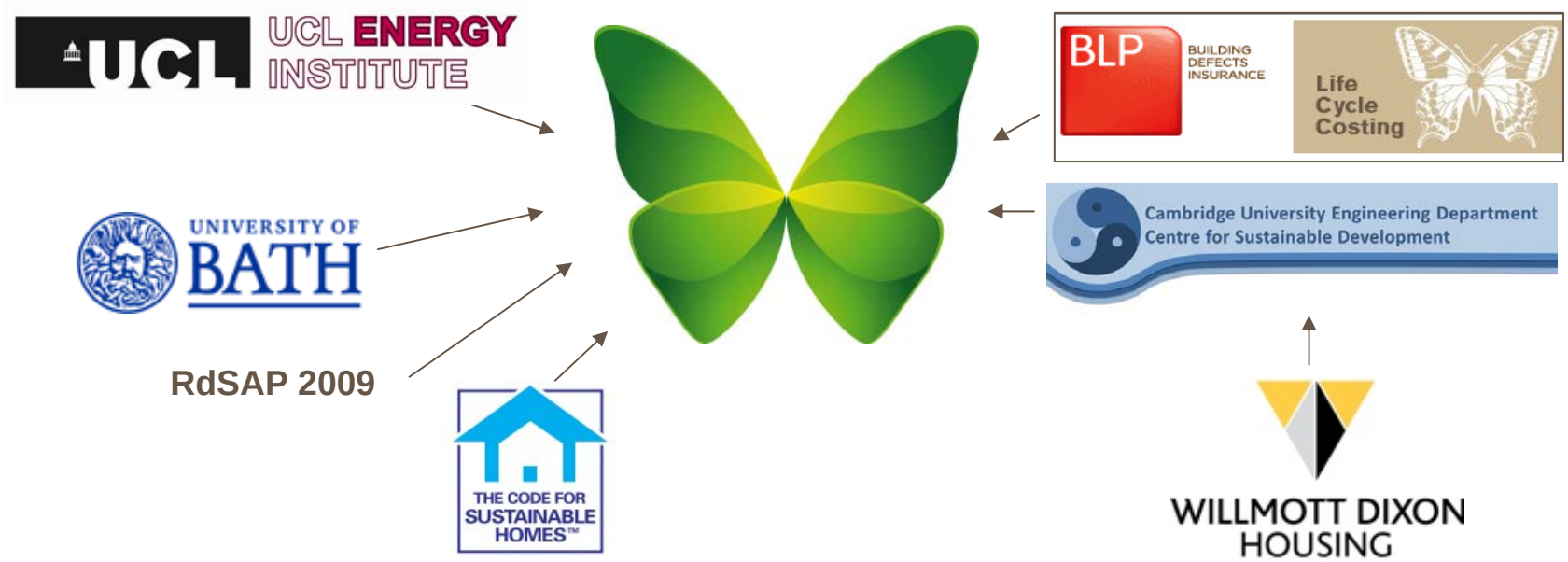
Low Carbon Design & Decision Tool

Please note that the figures provided and the results of the calculations are for illustration purposes only.

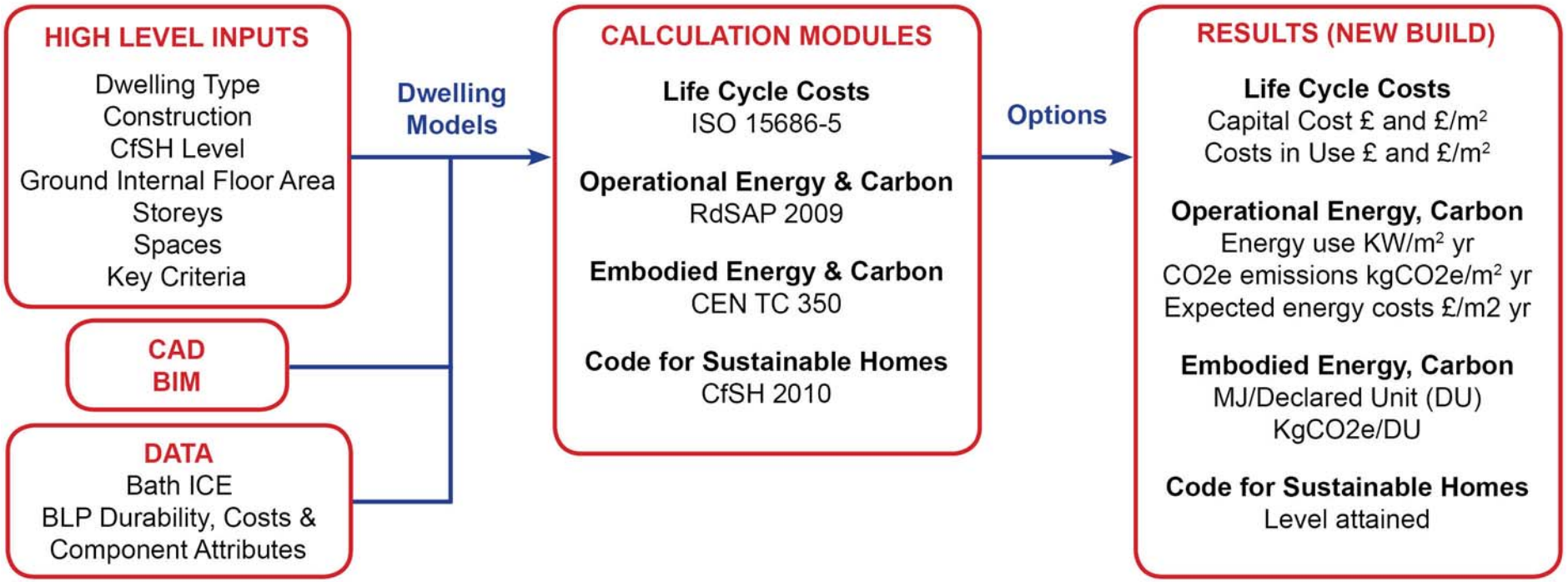
Background

- BLP
- The project

Butterfly calculations



The Butterfly process



Butterfly Dashboard Inputs

CAD input		
Use CAD input?	No	Yes/No
Block and dwelling options		
Site Postcode	HA7	
Block GIFA	220	m²
Block Orientation	0	Degrees
Dwelling type	Terraced House	
Dwelling footprint shape	Rectangular	
Layout of first dwelling	Default	
Pattern of dwellings	Regular	
Number of storeys	2	
Basement storeys	0	
Floor to ceiling height	2.65	m
Window GIFA ratio	0.25	
Construction and Code for Sustainable Homes Options		
Age band of block	New Build	
Target CfSH Level	Level 3	
Structural construction	Timber frame	
External window type	Softwood double glazed windows	
Foundations	Strip foundation C30 .6 x .15m	
Heating strategy	Gas	Gas

FEES Options		
Use FEES assemblies?	No	Yes/No
FEES Lowest floor	Suspended floor, insulated concrete beam; 0.10 W	
FEES External Wall	Timber Frame, brick clad, 0.1 W/m²K	
FEES Roof	Softwood pitched trussed rafter roof; 0.1 W/m²K	
Costing Options		
Carbon costing basis	Traded price of carbon - low estimate	
Period	60	Years
Discount rate	0.0%	
Inflation rate	0.0%	

Butterfly Headline Results

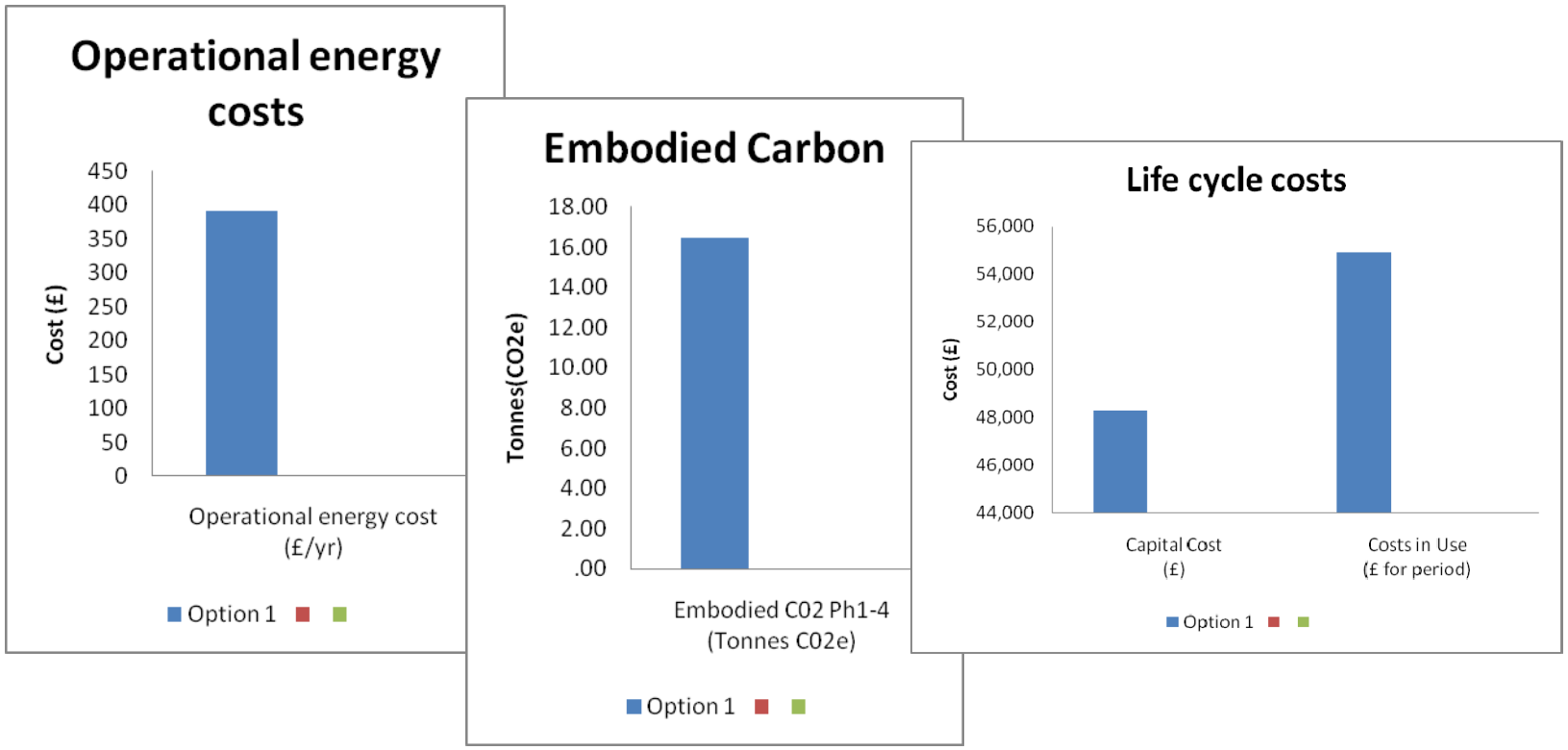
Footprint

Capital Cost	£48,305	
Costs in Use	£54,859	
Annual operational costs	£391	
Annual renewables savings	£0	
Regulated operational C02 emissions	1.70	Tonnes/year
Embodied Carbon (Phases 1-4)	16.47	Tonnes
Life Cycle Carbon Value and Component Cost Total	£120,815	

Butterfly Detailed Results 1

Life cycle carbon cost							
Life Cycle Carbon Value and Component C	£120,815						
Component Life Cycle Costs							
Capital Cost	£48,305						
Costs in Use	£54,859						
Operational Energy Metrics	**Energy Costs (£)**		**Energy Use (KWhr)**		**CO2e Emissions (Tonnes)**		**Carbon Value (£)**
	Regulated	**All energy**			**Regulated**	**All energy**	**Regulated**
Annual operational energy metrics	391	To follow	To follow		1.70	2.82	£259
Operational energy in-use metrics	23,479	To follow	To follow		102.29	169.39	£15,515
Annual saving due to renewables	0		To follow		0.00		To follow
In-use saving due to renewables	-		To follow		0.00		To follow
Embodied Energy Metrics	**Energy (MJ)**	**CO2e (Tonnes)**	**Carbon Value (£/tonne)**				
Total EE metrics	224,430	16.47	214				
Phase 1: Cradle to factory gate	178,266	12.38	£161				
Phase 2: Trasport to site	14,024	2.05	£27				
Phase 3: Construction	5,314	0.60	£8				
Phase 4: In-use	26,825	1.44	£19				
Phase 5: End of life	To follow	To follow	To follow				
Energy Compliance Metrics			**Target**	**Result**	**Source**		
Fabric Energy Efficiency	71 kWh/m² yr			Pass	ZCH		
DER - Design emissions rate	26 kWh/m² yr						
TER - Target emissions rate	21 kWh/m² yr						
Reduction of DER to TER	-23%		DER<TER	Fail	ADL1A		

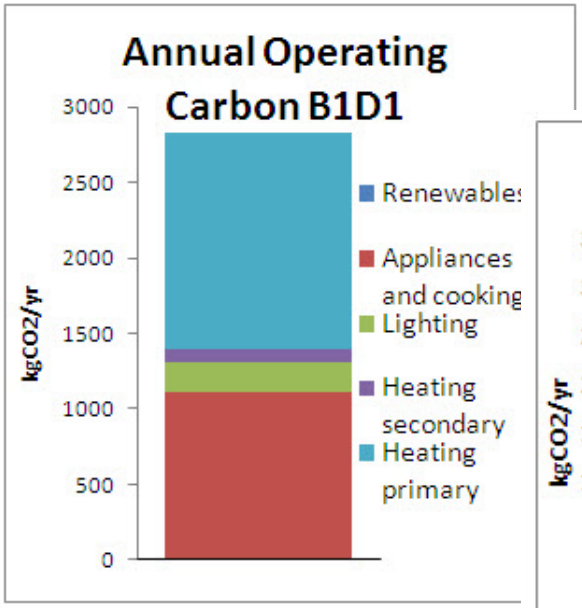
Butterfly Detailed Results 2

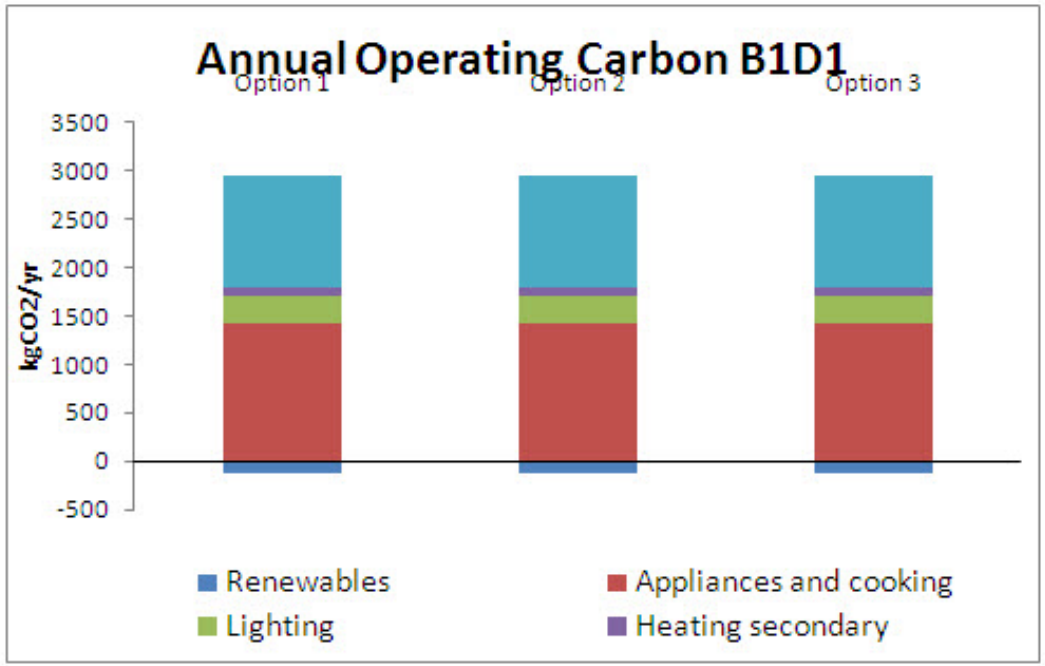


Butterfly Operating Carbon Results 1

Operational Energy Metrics	kgCO2/yr	kgCO2/m2	Carbon Value (£/tonne year)	Tonnes CO2 total over period	Carbon Value (£ for period)
Totals	2,823	42	37	169	477
Heating primary	1,422	21	£18	85	£240
Heating secondary	90	1	£1	5	£15
Lighting	192	3	£3	12	£33
Appliances and cooking	1,118	17	£15	67	£189
Renewables	0	0	0	0	0

Butterfly Operating Carbon Results 2

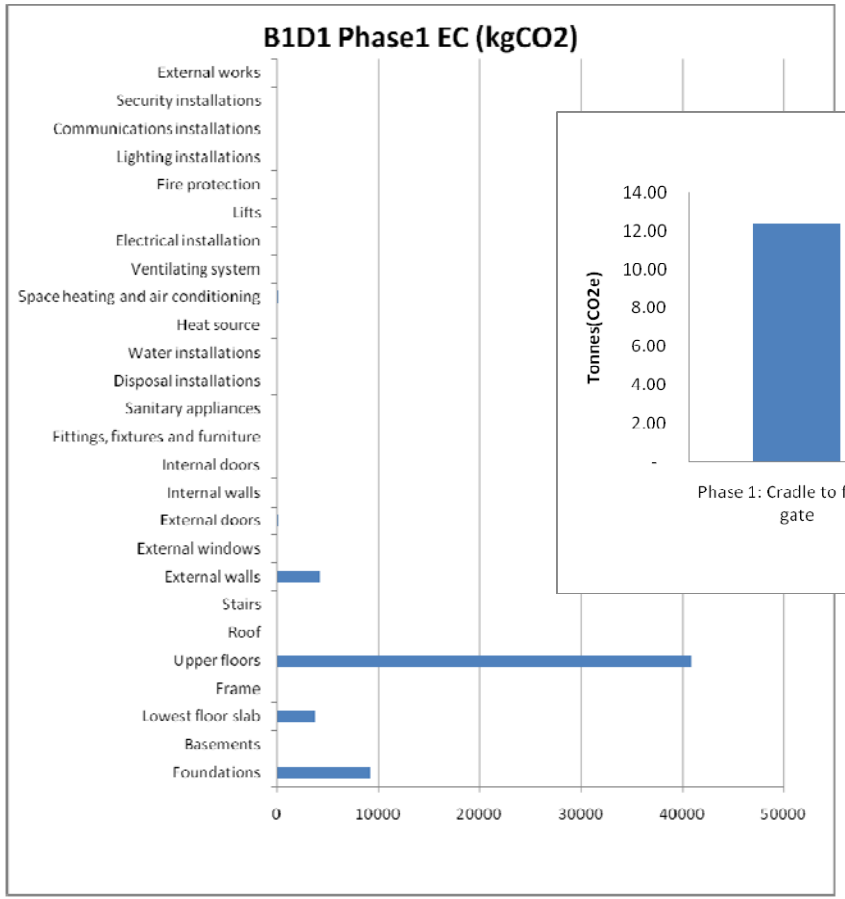


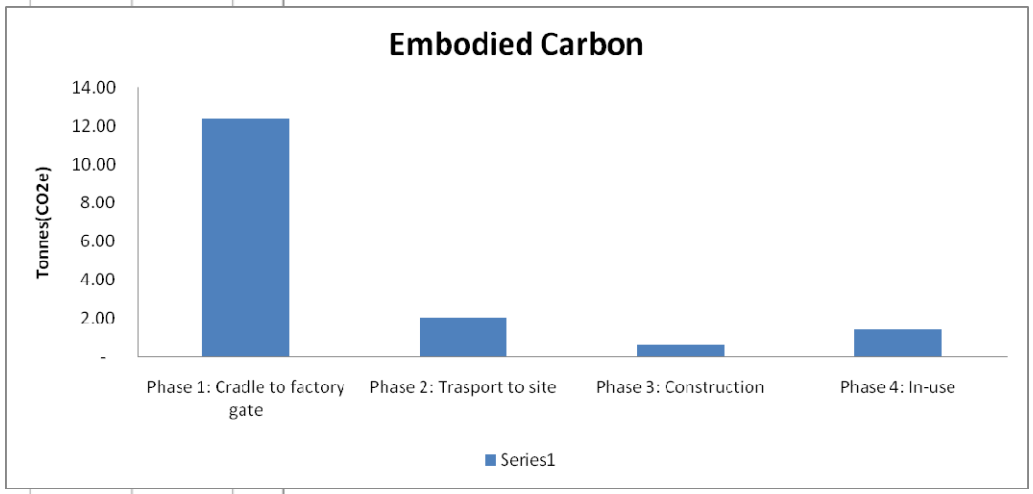


Butterfly Embodied Carbon Results 1

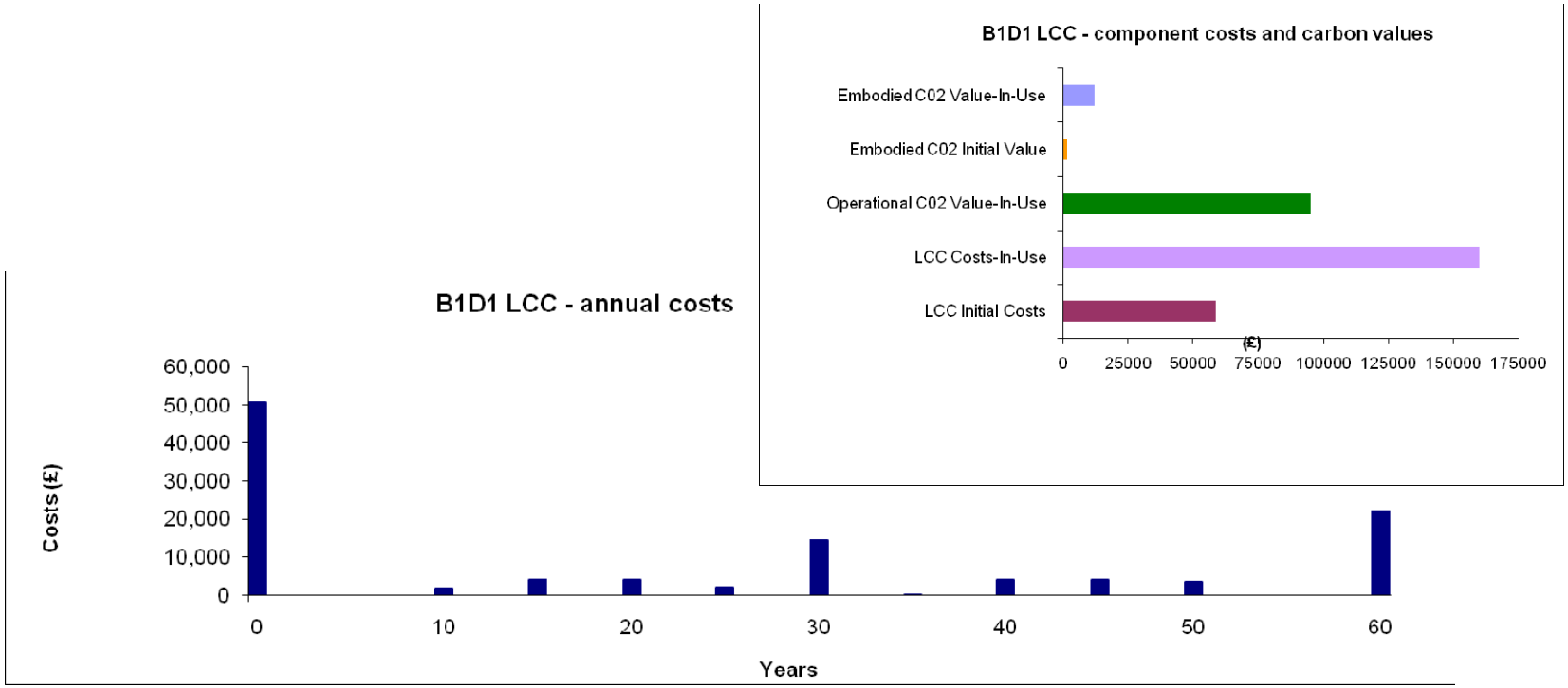
Embodied Energy Metrics	Energy (MJ)	CO2e (Kg)	Carbon Value (£)
Total EE metrics	224,430	15,029	£214
Phase 1: Cradle to factory gate	178,266	12,376	£161
Phase 2: Trasport to site	14,024	2,053	£27
Phase 3: Construction	5,314	598	£8
Phase 4: In-use	26,825	1.44	£19
Phase 5: End of life	To follow	To follow	To follow

Butterfly Embodied Carbon Results 2





Butterfly Life Cycle Cost Results



Impacts of changing the heating strategy from gas to PV

Option	User description	Period (yrs)	Capital Cost (£)	Costs in Use (£ for period)	Operational energy cost (£/yr)	Operational Carbon All (Tonnes	Embodied C02 Ph1-4 (Tonnes C02e)	Life cycle C02 Value & Component
Option 1	Gas	60	48,300	54,900	390	2.82	16.47	120,800
Option 2	PV	60	50,300	60,500	360	2.70	16.59	128,500

Impacts of changing the orientation of the block

Option	User description	Period (yrs)	Capital Cost (£)	Costs in Use (£ for period)	Operational energy cost (£/yr)	Operational Carbon All (Tonnes C02e/yr)	Embodied C02 Ph1-4 (Tonnes C02e)	Life cycle C02 Value & Component Cost (£)
Option 1	Orientation 0 degrees (from North)	60	52,800	62,400	496	3.61	17.55	129,600
Option 2	Orientation 180 degrees (from North)	60	52,800	62,400	487	3.57	17.55	129,600

Impacts of changing the foundation from ‘Strip’ to ‘Trench Fill’

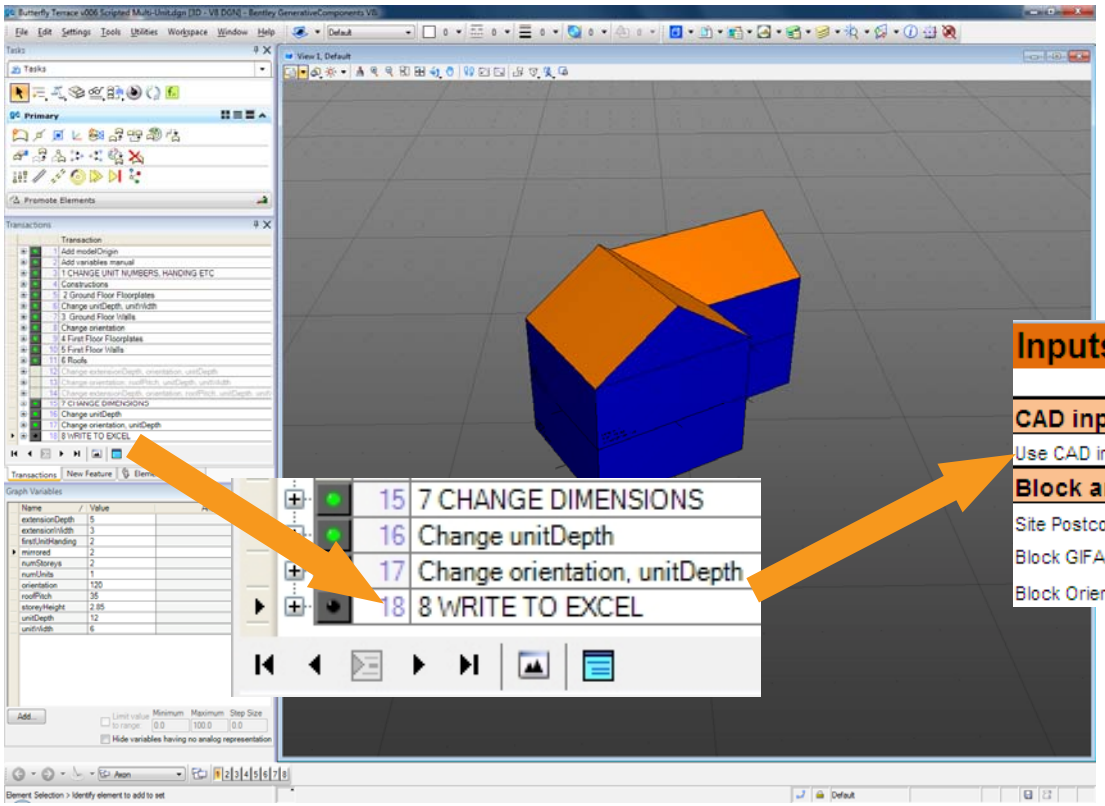
Option	User description	Period (yrs)	Capital Cost (£)	Costs in Use (£ for period)	Operational energy cost (£/yr)	Operational Carbon All (Tonnes	Embodied C02 Ph1-4 (Tonnes C02e)	Life cycle C02 Value & Component
Option 1	Strip Foundation	60	50,300	60,500	360	2.70	16.59	128,500
Option 2	Trench Fill Foundation	60	51,900	60,500	360	2.70	27.58	130,200

Components can be substituted and compared

Butterfly accesses the extensive data held on BLP's Components Database.

Type	Description	Quantity	Installation Cost (unit)	Life	LCC (£/y)
Natural slates	BS EN 12362-1 Water absorption <0.6%; Oxidation potential: None; Carbonate content: no limit	50.00m^2	65.00	20	142.45
Natural slates	BS EN 12362-1 Flexural strength >70Mpa; CMR >55Mpa; Water absorption <0.3%; Oxidation potential None; Carbonate content	50.00m^2	100.00	80	85.50

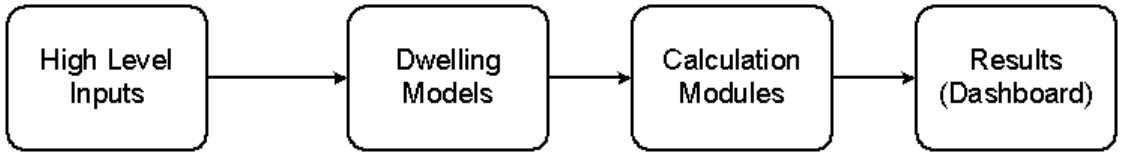
Butterfly can import data from CAD



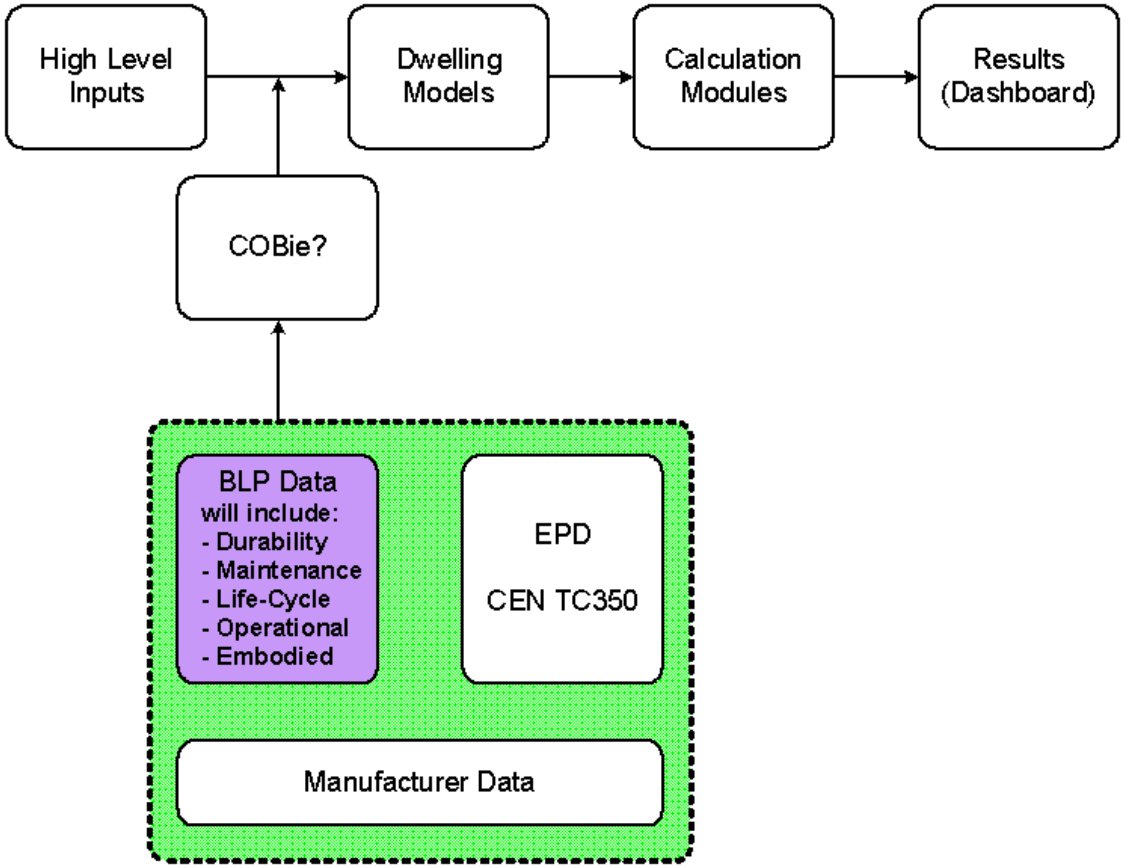
Inputs

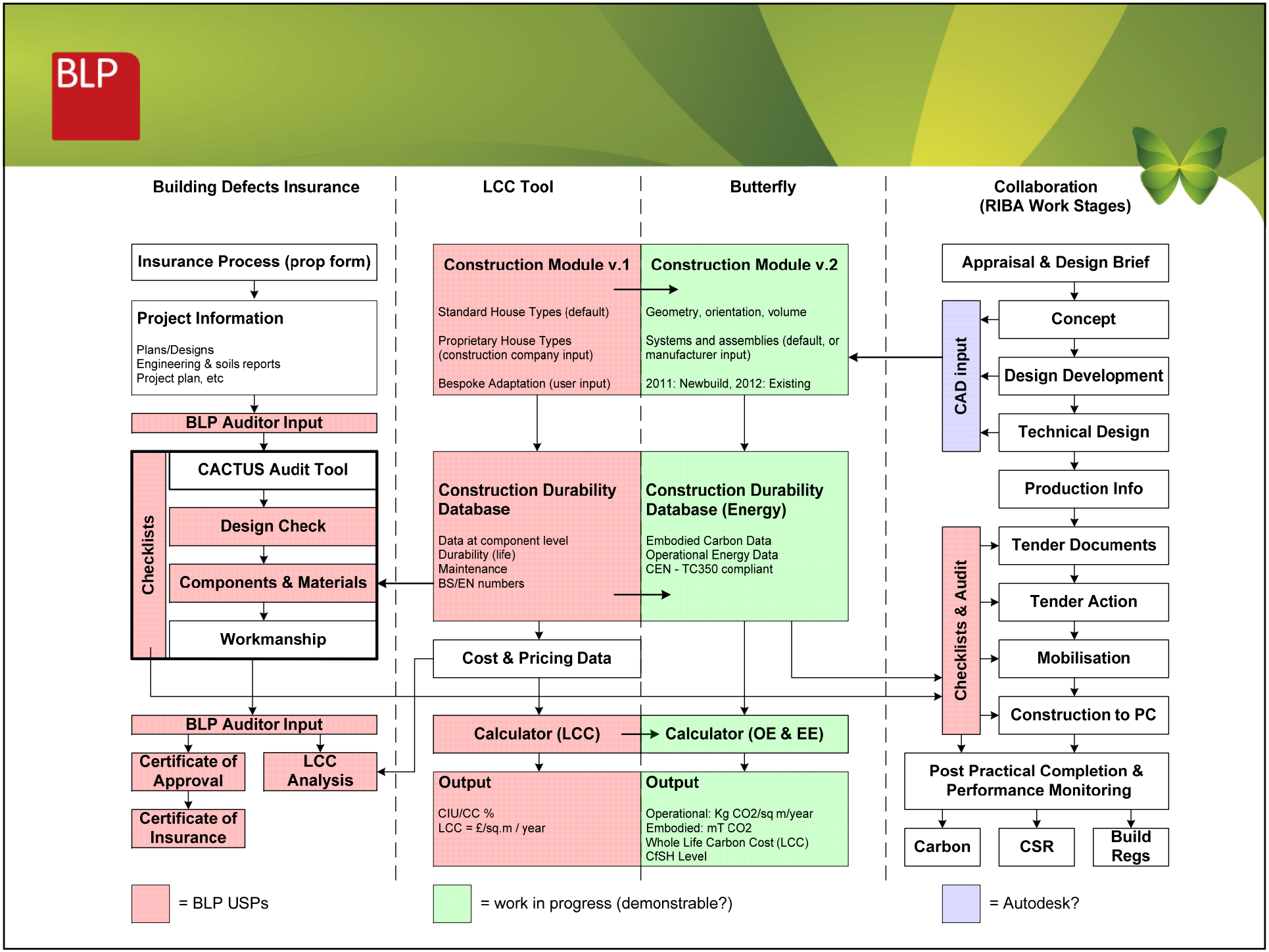
	User inputs	
CAD input		
Use CAD input?	Yes	Yes/No
Block and dwelling options		
Site Postcode	HA7	
Block GIFA	220	m²
Block Orientation	0	Degrees

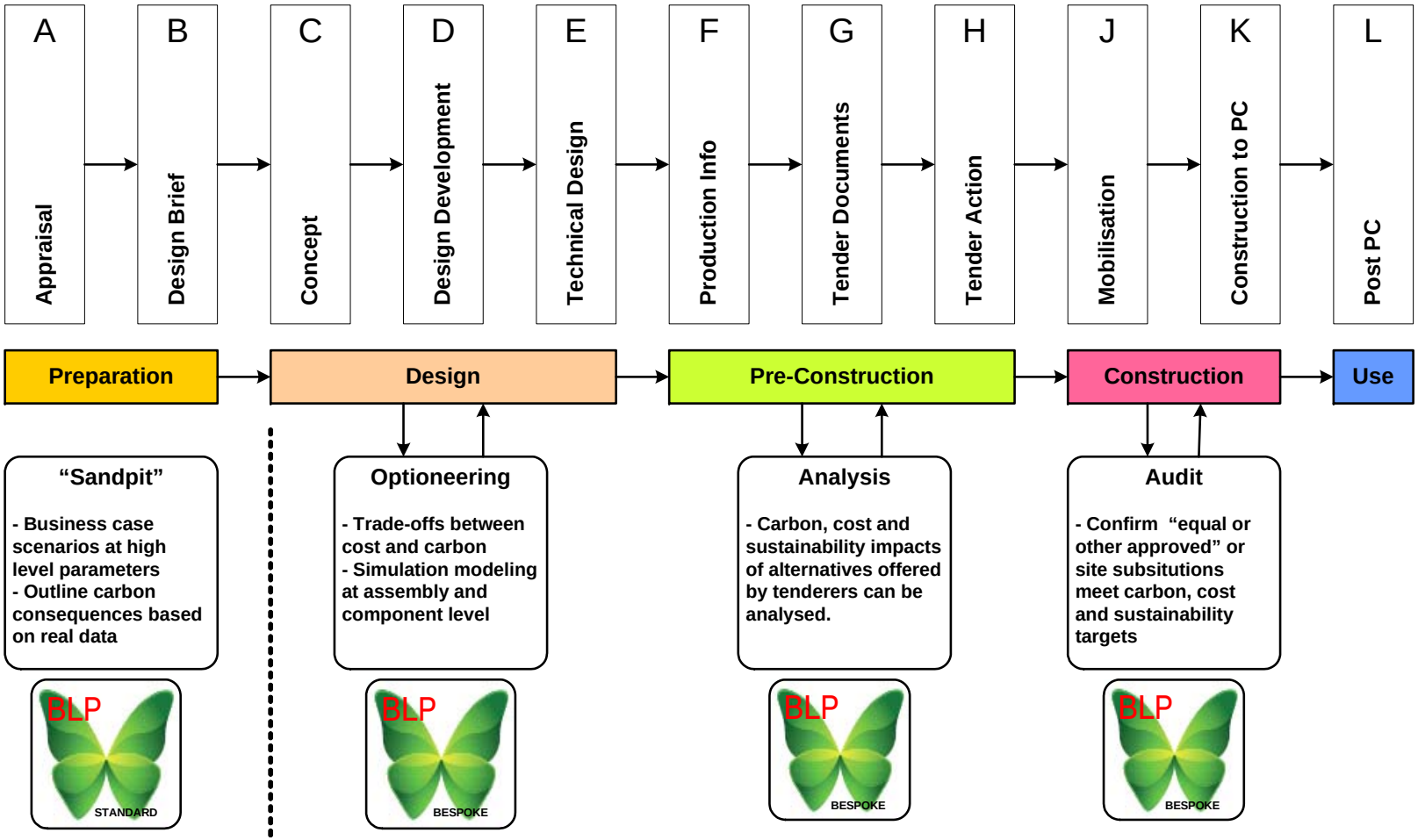
Here is the process again…..



Butterfly data in a BIM context




BLP
Building Defects Insurance
LCC Tool
Butterfly
Collaboration (RIBA Work Stages)
Insurance Process (prop form)
Project Information
Plans/Designs
Engineering & soils reports
Project plan, etc
BLP Auditor Input
CACTUS Audit Tool
Design Check
Components & Materials
Workmanship
Checklists
BLP Auditor Input
Certificate of Approval
LCC Analysis
Certificate of Insurance
Construction Module v.1
Standard House Types (default)
Proprietary House Types (construction company input)
Bespoke Adaptation (user input)
Construction Module v.2
Geometry, orientation, volume
Systems and assemblies (default, or manufacturer input)
2011: Newbuild, 2012: Existing
Construction Durability Database
Data at component level
Durability (life)
Maintenance
BS/EN numbers
Construction Durability Database (Energy)
Embodied Carbon Data
Operational Energy Data
CEN - TC350 compliant
Cost & Pricing Data
Calculator (LCC)
Calculator (OE & EE)
Output
CIU/CC %
LCC = £/sq.m / year
Output
Operational: Kg CO2/sq m/year
Embodied: mT CO2
Whole Life Carbon Cost (LCC)
CfSH Level
Appraisal & Design Brief
CAD input
Concept
Design Development
Technical Design
Production Info
Checklists & Audit
Tender Documents
Tender Action
Mobilisation
Construction to PC
Post Practical Completion & Performance Monitoring
Carbon
CSR
Build Regs
= BLP USPs
= work in progress (demonstrable?)
= Autodesk?



Standalone package

"Bespoke" analysis requires Butterfly to be integrated or "plugged in" to CAD packages

Feedback

- blpinsurance.com/butterfly
- LinkedIn group: blpbutterfly
- Twitter: @chooseBLP