

EWEN

Land adjacent to  
Wild Duck,  
Ewen, Cirencester  
GL7 6BY

## **5.4**

# CONSTRUCTION, MATERIALS AND ENERGY, METHODOLOGY

**We have put together two appendix documents that should be read in conjunction with this section -**

**APPENDIX 01\_HAWKES Architecture: Joined Up Thinking in Practice**

- *Since Hawkes Architecture's inception in 2008 while building the pioneering Crossway Passive House project which featured on Grand designs we have continued to test and develop myriad techniques and technologies which address a vast array of issues related to sustainable environmental design.*
- *'Joined up thinking in practice' is intended to provide an insight into some of the innovations Hawkes Architecture have been implementing and developing across several PPS 7, para 55 and para 79 projects over more than a decade.*
- *The intention is rather more to illustrate how multifaceted the principles that underpin the work of the practice are. Our work demonstrates a degree of joined up thinking rarely seen in the architectural profession.*
- *This joined up thinking comes from a mindset to challenge the reasons that underpin every single decision we make at every single point of the design process - from Inception to Completion and beyond.*
- *Ewen and every building Hawkes Architecture have designed has been approached with the same mindset and same challenging attention to detail*



**APPENDIX 02\_Evolution of Interseasonal Heat Storage Technologies**

- *Hawkes Architecture have been involved with the research & development of a genuinely pioneering combination of technologies which together provide Interseasonal Heat Storage, which is often considered to be the holy grail of renewable energy technologies.*
- *Ever since our first project, the Crossway Passive House which featured on Grand Designs back in 2009, we have been trialling, testing, monitoring, developing & updating a series of technological innovations which enable the harnessing of solar energy with exceptional levels of efficiency to provide power and heating requirements of a dwelling without any need for conventional heat energy sources.*



**HAWKES**  
architecture

**DESIGN AND CONSTRUCTION PRINCIPLES**

**REDUCE EMBODIED ENERGY**

- Transport
- Accuracy
- Co-ordination
- Detailing
- Innovative Engineering - Airtightness
- Local Materials

**IMPROVE BUILDING HEALTH AND WELLBEING**

- Relative humidity control
- Vapour transfer and Management - Hygroscopic

**REDUCE OPERATIONAL ENERGY USE**

- Fabric First Principles
- Passive Solar Gains
- Integrated Renewables

## DESIGN CONSIDERATIONS

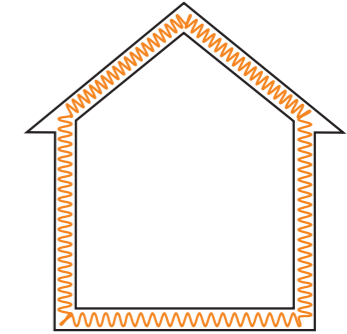
Using what we have learnt from the Average U.K. House dynamics, there is a need for new dwellings to be built better and use less energy. Therefore, we adopt 3 main construction and energy principles into our design:

### PRINCIPLE 1: Fabric First Approach

Reduce the amount of energy the building needs in the first place.

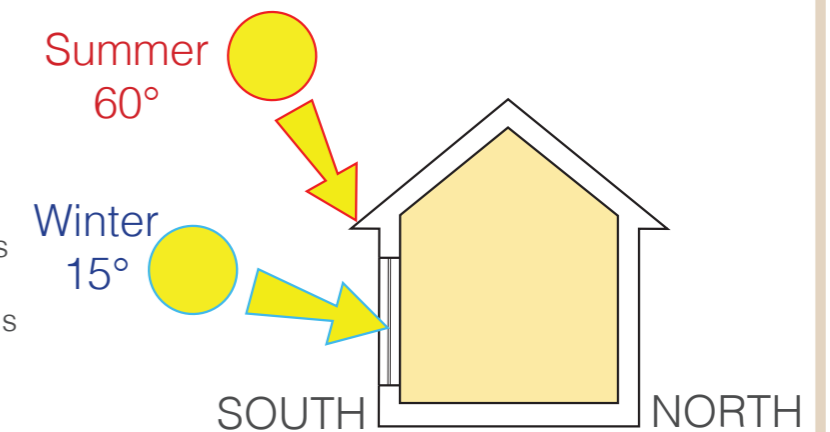
Focus investment on building envelope efficiency:

- High levels of insulation = less heat required
- High airtightness = less heat loss = less heat required
- High performance triple glazed windows = less heat loss
- Mechanical Ventilation Heat Recovery (MVHR) = less heat loss



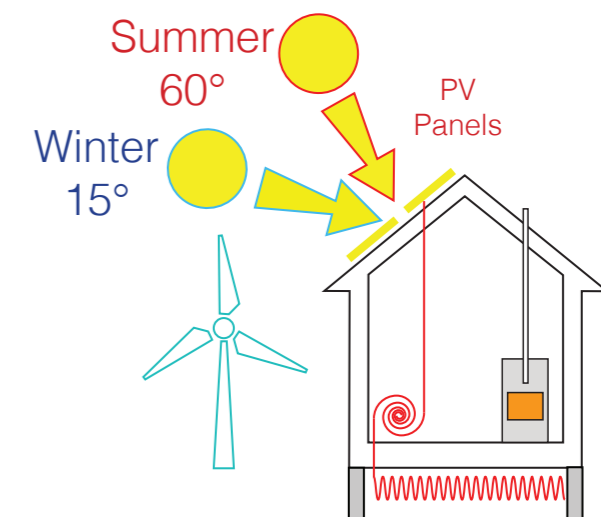
### PRINCIPLE 2: Passive Solar Gains

- Majority of glazing facing south to harness low Winter sun
- Shade high Summer sun through use of overhangs to reduce gains
- High Thermal mass = Resilience to outside temperature fluctuations



### PRINCIPLE 3: Integrated Renewable Technology to Provide Reduced Energy Requirement

- Wind, hydro, geothermal, biomass, solar and anaerobic digestion each have their pros and cons (see Renewable Energy Source Assessment). Other factors are based on availability on site and their visual impact. This will determine which renewable technology is most appropriate.
- The amount of renewable technology required will be dependent on the size of dwelling.





## 5.5.2 PRINCIPLE 1 - FABRIC FIRST APPROACH

CONSTRUCTION, MATERIALS AND ENERGY, METHODOLOGY

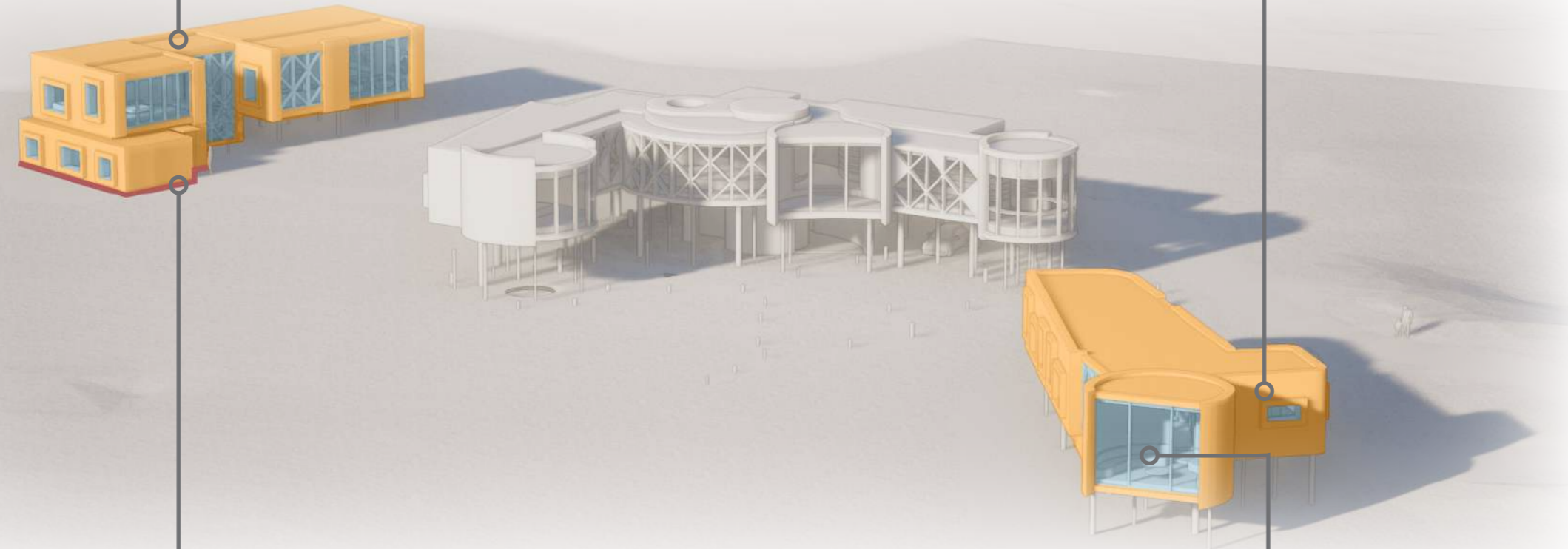
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### ROOF AND WALLS - U-VALUE 0.12 W/M2K

300mm engineered timber framed panels. Recycled newspaper insulation, Panelvent external cladding, Actis multifoil insulation internally enhances insulation & performs airtightness & vapour barrier roles. External cladding varies.



### SLAB - U-VALUE 0.11 W/ M2K

The slab sits on insulated strip footings. Perimeter blockwork lifts the timber frame up to prevent moisture contact with the ground.

### WINDOWS - U-VALUE < 0.8 W/ M2K (INC. FRAME)

Triple glazed, triple sealed Argon filled timber framed & insulated aluminium clad "Passivhaus" certified windows & doors to be specified throughout.



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## 5.5.3 PRINCIPLE 2 - SOLAR ORIENTATION & PREVAILING WINDS

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### SUMMER SOLSTICE

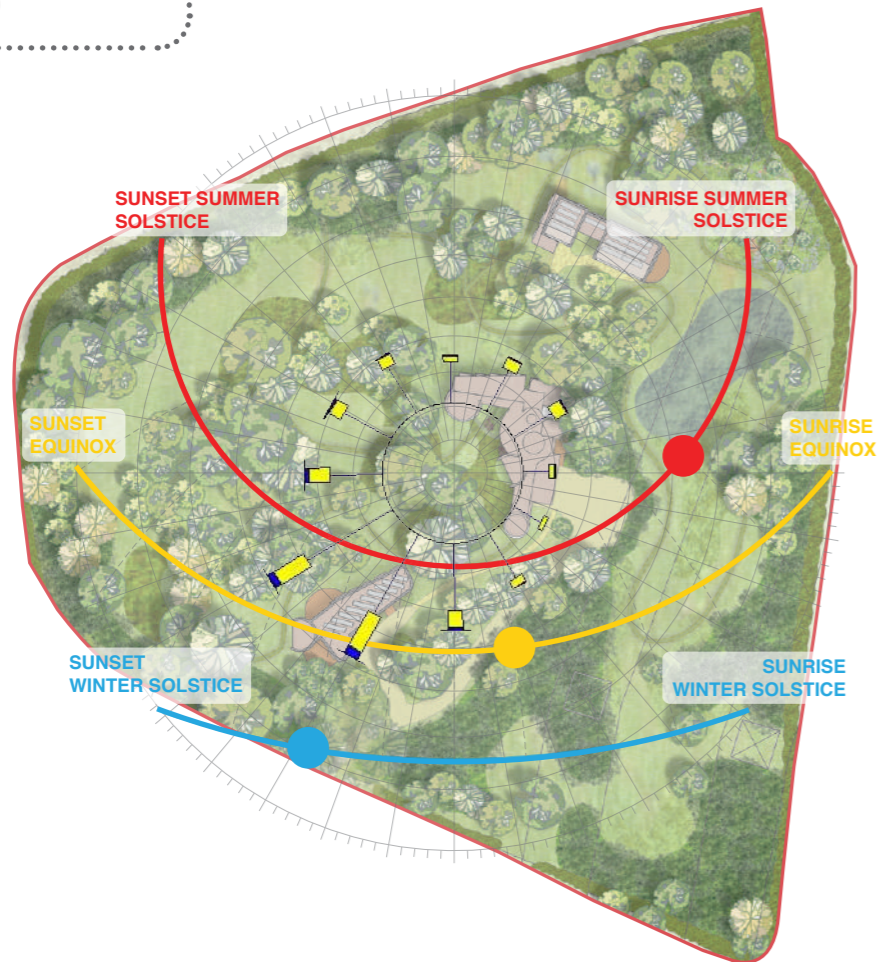
Sunrise 04.50  
Sunset 21:30

### EQUINOX

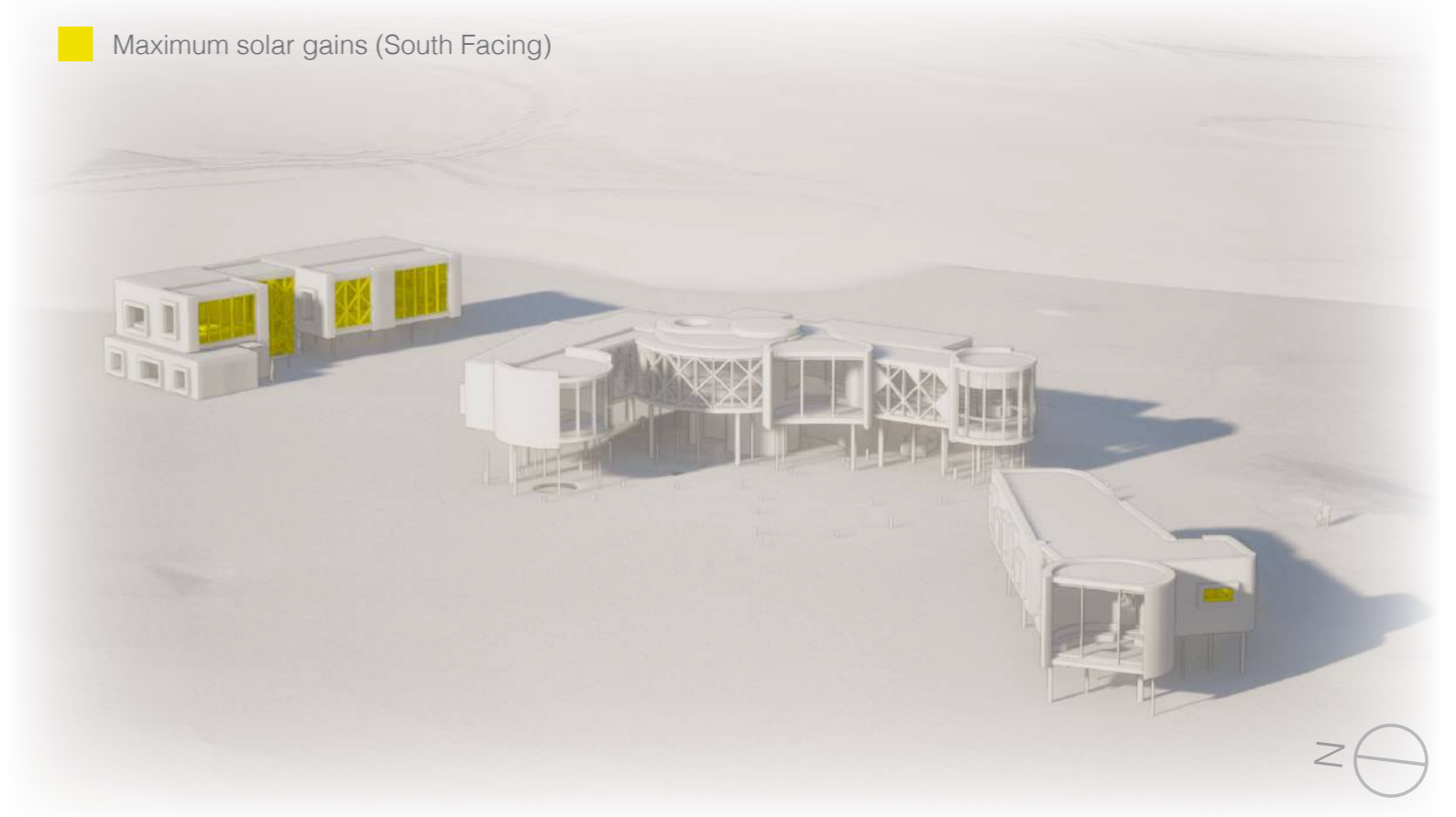
Sunrise 06.09  
Sunset 18.22

### WINTER SOLSTICE

Sunrise 08.12  
Sunset 16:00



■ Maximum solar gains (South Facing)



### MICROCLIMATE

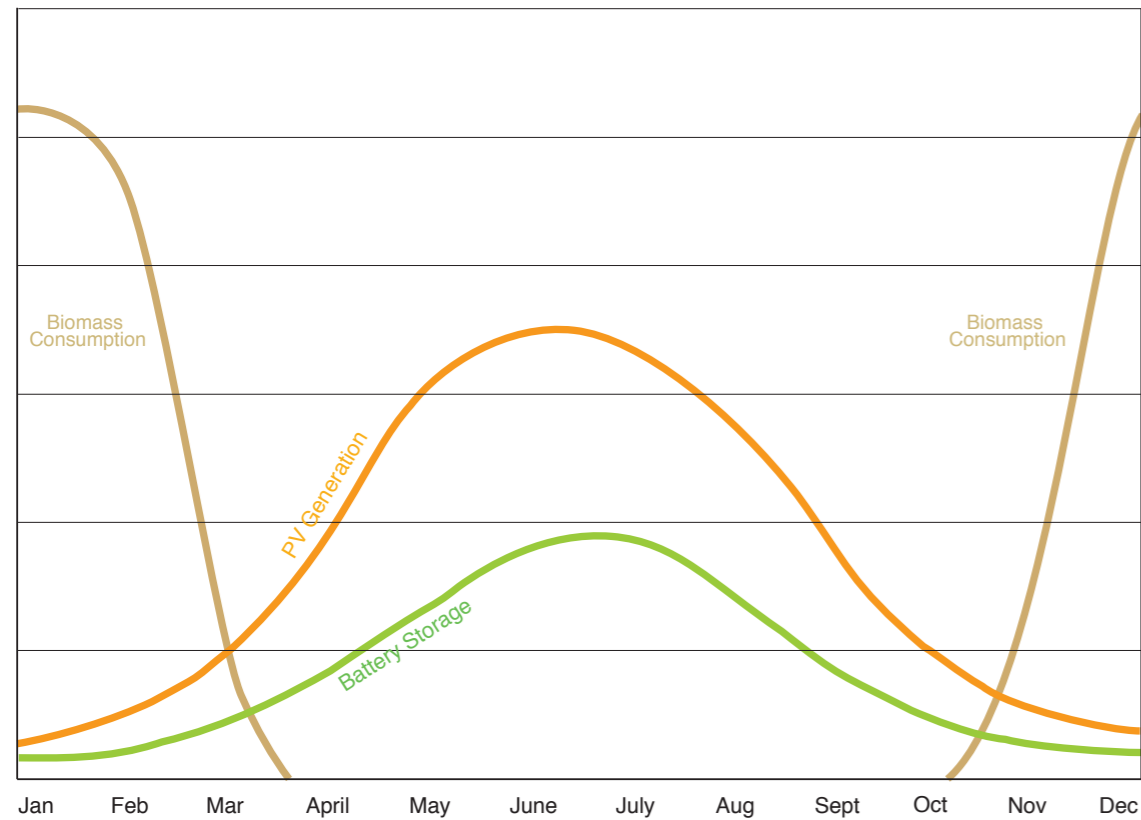
The woodland provides shelter from direct winds including the strongest ones, in average coming from the south-west.

The dense vegetation allows filtered daylight/sun-rays to pass through the woodland. Some areas however thanks to smaller or larger openings among the trees receive more direct light during the day and allow bigger diversity.

### DESIGN CONSIDERATIONS

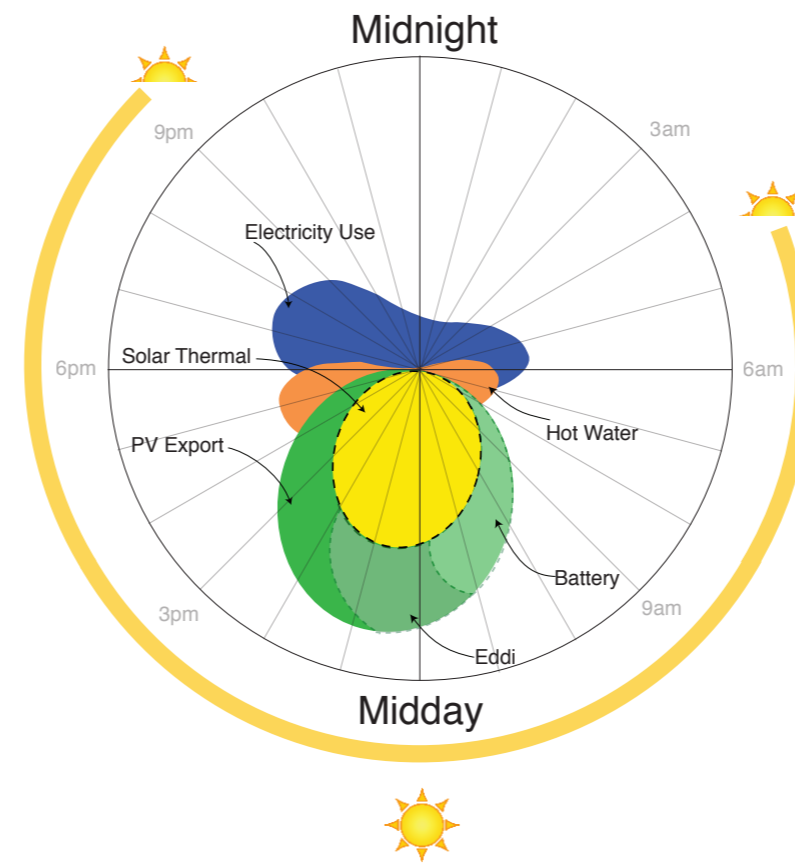
- Maximise solar gain by pushing the annexes away from shading trees (within glade). Horizontal distance reduced by lifting the building up from ground.
- Use of internal and external spaces to respond to sun path.
- Living area (more open facade) to benefit from sunlight the most.
- Less open facades with strategically placed punch windows to frame long distance views among the trees (brighter views).

## Seasonal Energy Strategy



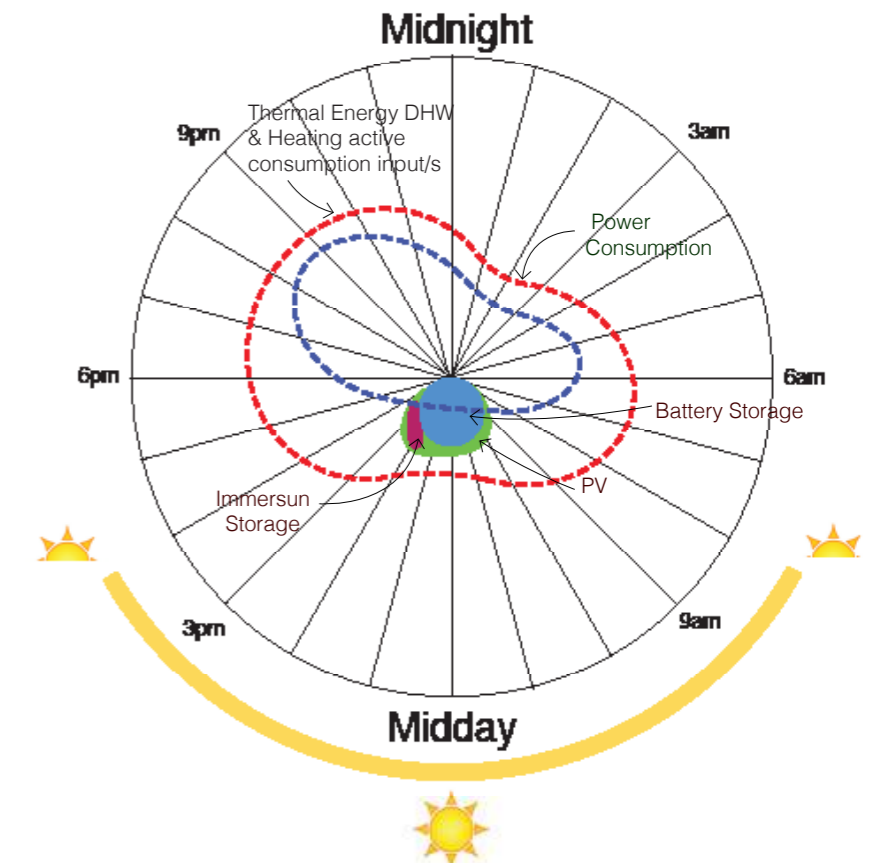
- Fabric First Principles to reduce need for heating
- Maximise opportunities for Passive Solar Gains
- Harness the sun's heat during the Summer months
- Store the sun's heat for use over Winter

## Summer Energy Strategy



- Store thermal energy during the summer for the use in winter.
- Store electricity during the day for use at night
- Convert excess electricity into heat for hot water
- Reduce dependence on the National Grid

## Winter Energy Strategy



# 5.5.5 PRINCIPLE 3 - RENEWABLE ENERGY SOURCES FOR EWEN

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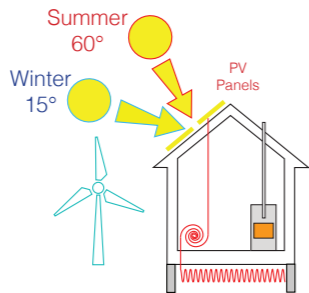
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ENERGY SOURCE	WIND 	HYDRO 	GEOHERMAL 	BIOMASS 	SOLAR 	ANAEROBIC DIGESTION 	HEAT PUMPS GSHP / ASHP 	
<b>FACTORS</b>								
<b>Energy Source Input Characteristics</b>	Seasonal Availability	<b>5</b> Year round source. Highest performance in winter months.	<b>0</b> Year round seasonal availability. Highest performance in winter months	<b>5</b> All year round source and performance	<b>5</b> All year round source and performance	<b>-5</b> High seasonal fluctuations	<b>5</b> All year round source and performance	<b>0</b> Power consumption to harness is winter biased
	Harness Power	<b>5</b> Dependent on Height / average wind speeds and level of disturbance	<b>0</b> Dependant on head and flow availability	<b>-5</b> N/A	<b>-5</b> Relatively Low (requires CHP)	<b>5</b> Relatively High using Photovoltaics (PVT)	<b>-5</b> Relatively Low (requires CHP)	<b>-5</b> No
	Harness Heat	<b>-5</b> N/A	<b>-5</b> N/A	<b>-5</b> Relatively Low	<b>5</b> Relatively High	<b>0</b> Relatively High in Summer Months	<b>5</b> Relatively High	<b>0</b> Moderate
	Cost to Harness	<b>5</b> Relatively Low	<b>-5</b> Relatively High	<b>-5</b> Relatively High	<b>5</b> Relatively Low	<b>5</b> Relatively Low	<b>-5</b> Relatively High	<b>0</b> Moderate
	Running Cost	<b>5</b> Relatively Low	<b>5</b> Relatively Low	<b>-5</b> Requires a significant electrical energy input to run heat pump in winter months	<b>5</b> Relatively Low	<b>5</b> Relatively Low	<b>5</b> Relatively Low	<b>-5</b> Relatively High
<b>CHARACTERISTICS SUBTOTAL SCORE</b>	<b>15</b>	<b>-5</b>	<b>-15</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>-10</b>	
<b>Suitability to Application Site</b>	Availability on Site	<b>-10</b> Low Potential	<b>-10</b> No access to flowing water or large bodies of water onsite	<b>5</b> Theoretically yes, dependent on ecology.	<b>-10</b> Sustainable area of manageable woodland to harvest biomass	<b>-5</b> Few open unshaded areas on site	<b>-10</b> No livestock onsite	<b>10</b> Yes
	Visual Impact	<b>-10</b> Very high visual impact	<b>0</b> N/A	<b>15</b> Low sensitivity, cannot be seen	<b>10</b> Low sensitivity	<b>5</b> Low visual impact depending on location of PV array	<b>-5</b> N/A	<b>15</b> None
<b>SITE SUITABILITY SUBTOTAL SCORE</b>	<b>-20</b>	<b>-10</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>-15</b>	<b>25</b>	
<b>CONCLUSION</b>								
<b>OVERALL TOTAL SCORE</b>	<b>-5</b> Visual impact too high	<b>-15</b> No potential resource on site	<b>5</b> High winter running costs	<b>15</b> Substantial woodland area to be managed will result in high amount of sustainable	<b>10</b> Cheap to harness. low/medium visual impact in setting depending on location	<b>-10</b> Requires imported energy	<b>15</b> Requires power during winter. Very low visual impact.	

### 3. INTEGRATED RENEWABLES

**Proposed Daily Energy Solution:** Integrate Renewable Technology to heat and power the dwelling.



- ### DESIGN CONSIDERATIONS
- Solar technology may be suitable if suitably positioned so that the impact of tree shading is minimal.
  - Biomass would be suitable through sustainable woodland management. This would be best used in winter months when solar energy is less reliable.
  - Heat pumps are suitable due to their low visual impact however the replacement of heat pumps over the lifespan of a building questions its sustainability and overall lifetime cost.

### KEY TO SCORING

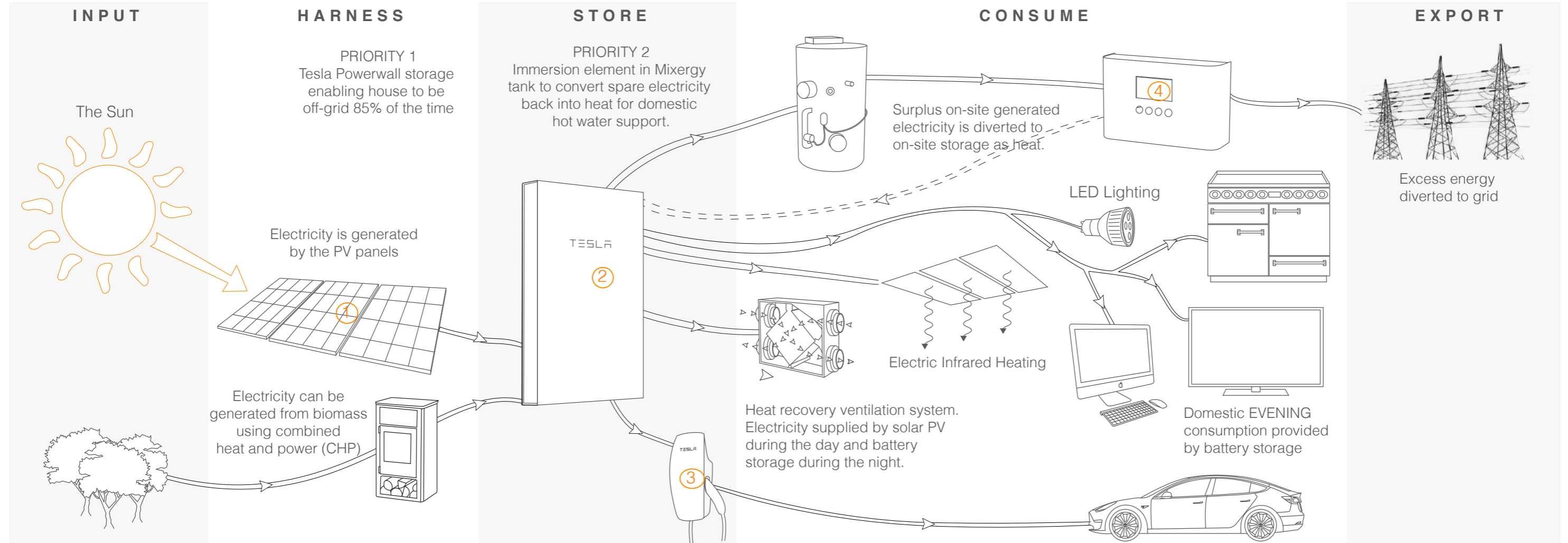
Characteristics Score		Site Suitability Score		Overall Score	
-5	Negative	-15	Negative	<0	Not Suitable
0	Neutral	-5	Negative	0	Potentially Suitable
5	Positive	0	Neutral	5	
		5	Positive	>10	Most Suitable
		10	Positive		
		15	Positive		



**5.5.6 PRINCIPLE 3 - POWER STRATEGIES**  
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**① PV ARRAY**

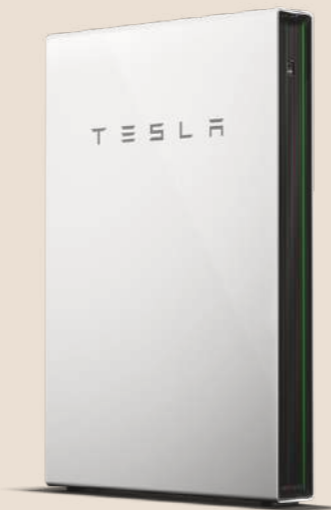
PV Panels have been designed to work in partnership with Tesla's Powerwall 2.0 Solar Battery which, would enable you to store the energy produced by the panels for use during the night or in the event of power cut. Implemented on Crossway.



**② TESLA POWERWALL**

Powerwall stores energy efficiently, detects outages and can become a households energy source when the grid goes down.

Solar panels can be connected and recharge the powerwall to upkeep household appliances. Preferences can be set to optimise the energy output, for the households consumption, through your smartphone.



**③ ZAPPI**

Zappi is an eco-smart charging station for electric vehicles. it operates as an electric vehicle charger, but it has charging modes to harness energy generated from Sovlar PV generation. Compatibility with smartphones allows you to find the most optimal



**④ EDDI POWER DIVERTER**

The Eddi power diverter includes a grid current sensor, which monitors the households power generation. The excess energy is diverted to the household heating devices. The Eddi is capable of logging data to save the homeowner ongoing savings by optimal energy usage.



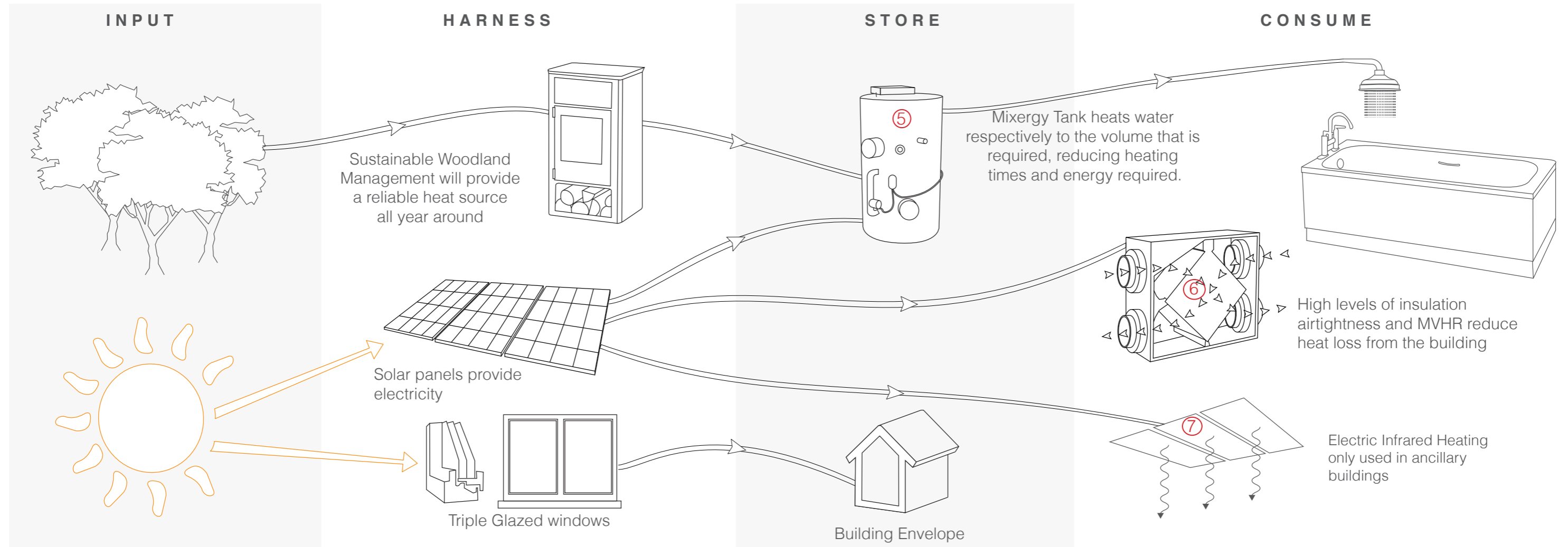


## 5.5.7 PRINCIPLE 3 - HEAT STRATEGIES

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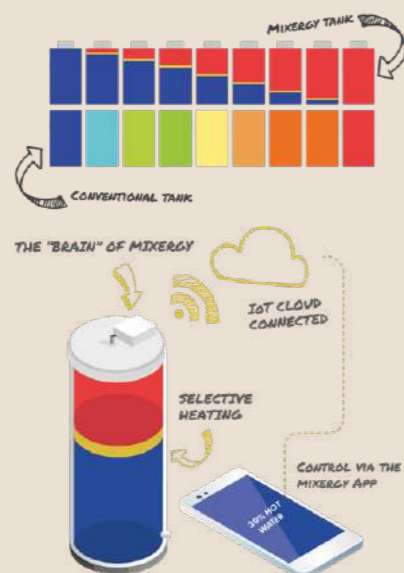


### 5 MIXERGY

Conventional hot water tanks heat all of the water, irrespective to how much hot water is desired by the consumer. This wastes energy heating water that isn't desired by the consumer and can result in long heating times.

The Mixergy tank differs to conventional tanks in three fundamental ways:

- Mixergy allows you to heat the water by volume, instead of time.
- Sensors monitor the temperature and make hot water volumes measurable.
- Ability to remote control the Mixergy tank from a smartphone.



### 6 MECHANICAL VENTILATION HEAT RECOVERY

MVHR is an essential element of an airtight low energy building. If a building is airtight it will lose less heat and consequently reduce the amount of heat it needs.

MVHR systems provide a constant supply of clean fresh air in a house while recovering over 90% of the heat from the 'stale' air as it is extracted. MVHR systems also regulate Relative Humidity to between 40% and 60% which optimises air 'health' and CO<sub>2</sub> levels to maximise occupant comfort.



### 7 INFRARED HEATING

Infrared heating technology differs from traditional models of heating, rather than producing hot water & feeding a wet central heating system (underfloor heating & radiators) which heat the room via convection, this technology is fitted within walls or ceilings and radiates heat into the room. Where convection heating heats the air directly, radiant heating heats the building fabric & surfaces of items within a room, providing instant & flexible heat. This system saves energy against direct electrical heating because occupant comfort is achieved at an air temperature around 3°C lower than with a convection

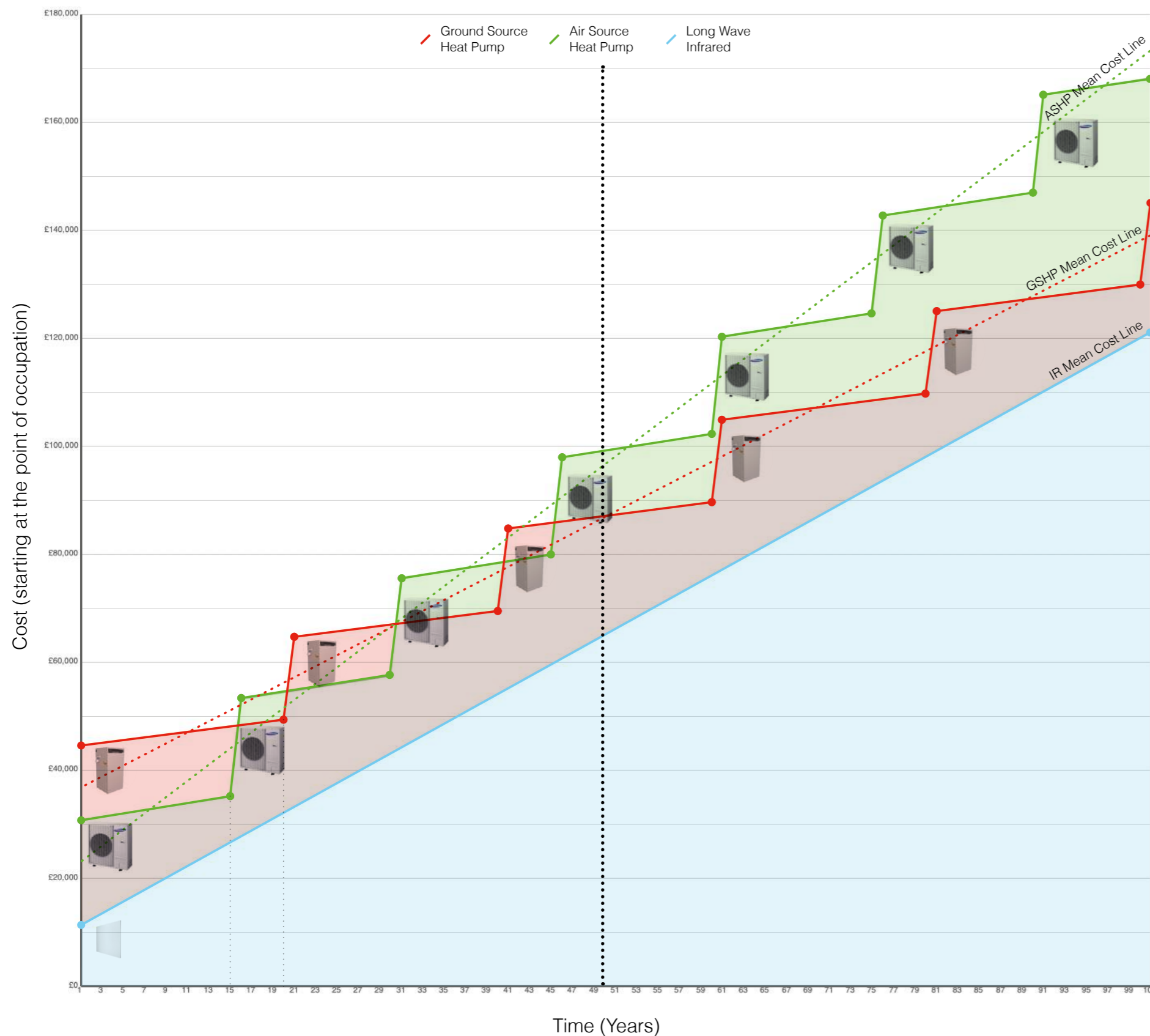


system, which means less space heating is required. Being electrically driven this system, when paired with Solar PV & batteries offers a low carbon solution, using on-site generation & off-peak electricity, to keep cost and carbon emissions low. Due to a quicker heating time this system will be used in the outbuildings to match the sporadic occupancy.

**5.5.8 LIFECYCLE COST COMPARISON: GHSP, ASHP & LONGWAVE I.R.**  
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**Where do all the worn out heat pumps end up?**



This research reveals that the true cost of installing, running and maintaining heat pump based systems is dramatically different to the generally perceived efficiencies created by a heat pump's Coefficient of Performance (CoP).

Each of the vertical steps represents a replacement heat pump.

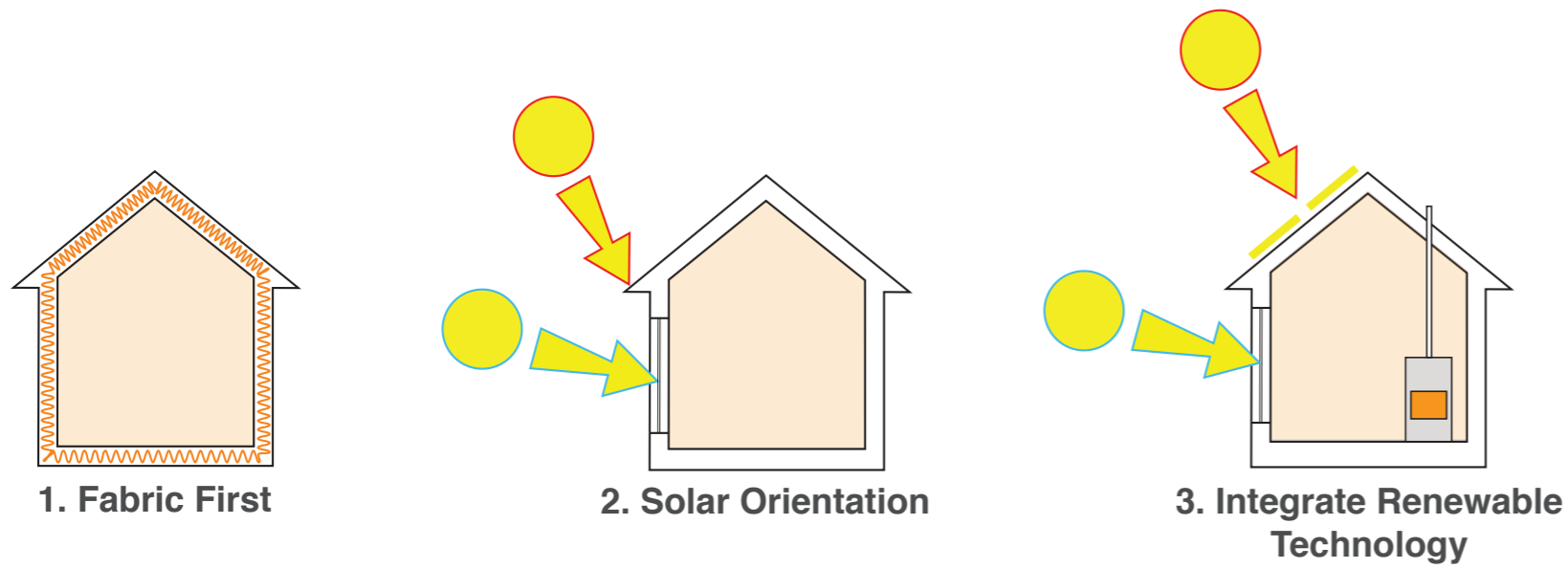
For example, over a 50 year period not only are the heat pump costs significantly higher than an alternative technology, such as longwave I.R shown, but there will have been 3 ASHP replacements or GSHP replacements during that period. Where do all the worn out old heat pumps end up?

**LEARNING OUTCOMES**

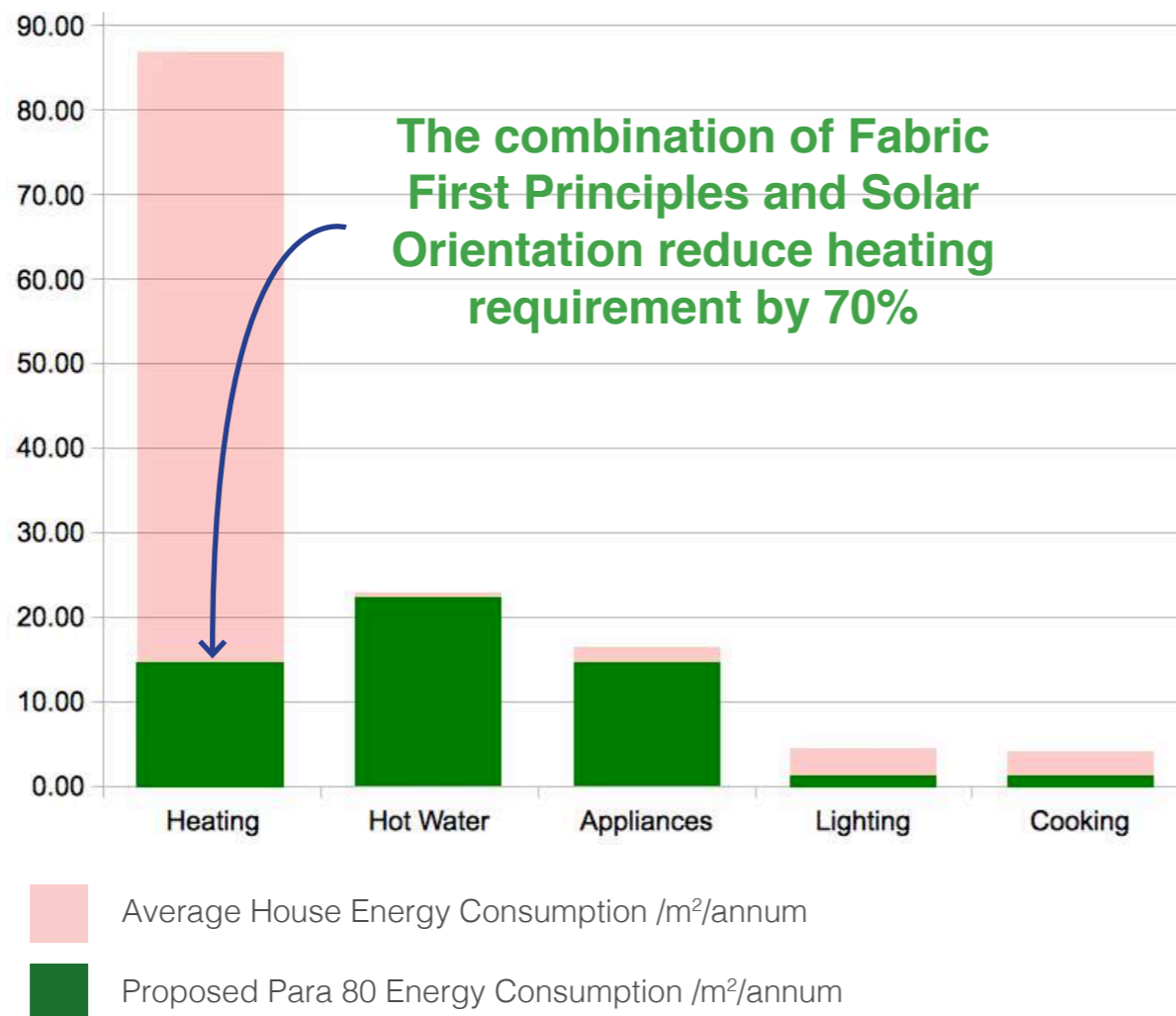
- **Hawkes Architecture do not believe that heat pumps are an appropriate technology to drive a low carbon future.**

This research has been conducted by Hawkes Architecture in association with MESH energy.

This is based of 8 kWh per annum at 0% inflation.



Proposed Energy Consumption



SUMMARY

The Seasonal and Daily Problem

- We use most energy in winter when there is the least amount of sun. The Average UK New Build does not have much insulation and are often built with poor performing windows. This means the building leaks air and heat. New builds are not designed to maximise solar orientation and so a higher heat load is required to keep the building warm through the winter months resulting in more energy being used.

The Solution

Principle 1: Fabric First Principles

- Invest on building envelope efficiency to allow the building to need and use less energy throughout the year.

Principle 2: Passive Solar Gains

- Where possible provide opportunities through orientation and design to harness passive solar gains throughout the day.

3. Integrated Renewable Technology

- From analysing the site at Ewen, the most appropriate primary renewable technologies for the proposed dwelling are biomass and solar technology. Heat pumps are not suitable for this site due to the localised demand on power supply during in winter months.

Conclusion

- By implementing the 3 construction and energy principles, we are capable of reducing the heat load of the proposed Paragraph 80 dwelling at Ewen by 70% when compared to the Average New Build.



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## **Part 6:** CONTINUED RESEARCH INTO BUILDING PERFORMANCE

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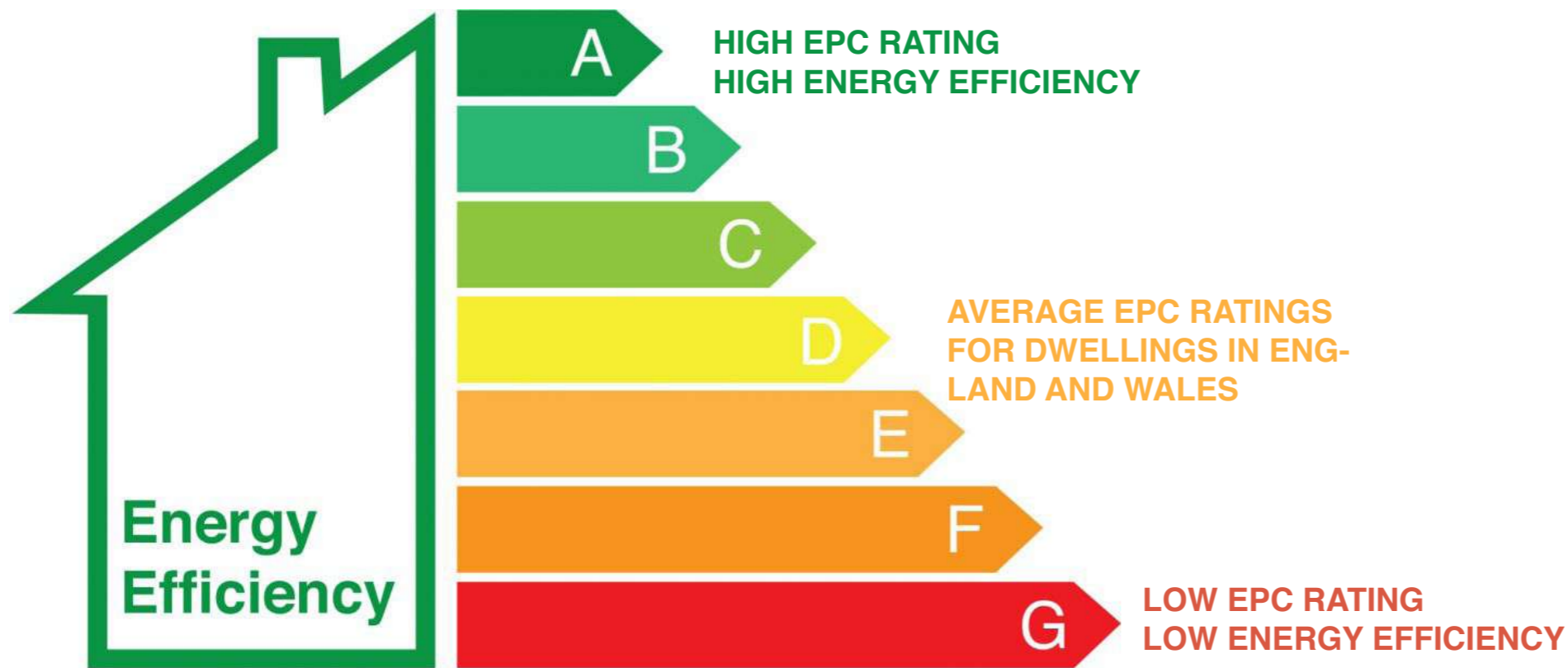
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## 6.1 EPC RESEARCH - MEETING THE TESTS

CONTINUED RESEARCH INTO BUILDING PERFORMANCE

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An EPC (Energy Performance Certificate) rating is a **review of a property's energy efficiency**. They're primarily used to see how much energy bills will cost in a dwelling.

A dwelling's EPC rating will depend on:  
The amount of energy used per m<sup>2</sup>  
The level of carbon dioxide emissions (given in tonnes per year)

The higher the rating on the EPC the lower the energy bills will be.

**The average energy efficiency rating for a dwelling in England and Wales is a D - 60.**

Over the past 14 year, Hawkes Architecture has built and continues to build extremely energy efficient houses. Using the 3 Construction and Energy Principles, our most recently built houses exceed the average house dwellings by double!

Over the following pages, the EPC rating can be seen for each built project by Hawkes Architecture.

These figures prove that the construction and energy methodology have been proven and continue to develop and improve with each project by Hawkes Architecture.

## RIBA House of the Year 2021: How green are the contenders?

2 DECEMBER 2021 . BY RICHARD WAITE



1/6 RIBA House of the Year 2021 (shortlist): House in Assynt (Sutherland, Scotland) by Mary Arnold-Forster Architects  
Source: David Barbour

Not one of the current contenders vying for the 2021 RIBA House of the Year title has an A-rated energy performance certificate (EPC), according to new research shared with the AJ

Last night (1 December) the latest two finalists were unveiled on **Channel 4's Grand Designs: House of the Year**, meaning six of the eight houses battling it out for this year's crown have now been revealed.

Wednesday's episode saw Mary-Arnold Forster Architects' House in Assynt – described as a sustainably built timber home with spectacular views on the west coast of Scotland – and TYPE Studio's 'exquisite' conversion of an early 19th century stone barn added to the four schemes announced already. Those were: The Water Tower by Tonkin Liu; House on the Hill by Alison Brooks Architects; The Slot House by Sandy Rendel Architects with Sally Rendel; and House for Theo and Oskar by Tigg + Coll Architects.

But how green are the homes in the running for the prestigious prize? Research carried out by Hawkes Architecture shows that none of the houses shortlisted so far has an A-rated energy performance certificate (EPC). Surprisingly half were D-rated or worse.

The practice has collated data ([click here to search](#)) for more than 100 different 'notable' houses and is continuing to build up a database of EPC/SAP ratings to see 'if any trends can be found in the technical performance of buildings over time'.

Its studies showed that only one of the 20-strong longlist of schemes in the running for the RIBA accolade had achieved an A-rating.

Richard Hawkes, director of Hawkes Architecture, said the practice recently started pulling together the data 'to track the energy performance progress of projects which make it onto the top table at the annual housing awards'.

## RIBA House of the Year 2021

The RIBA House of the Year is awarded to the best new house designed by an architect in the UK

# GRAND DESIGNS

*"Helping to raise standards of design more generally in rural areas"* NPPF Paragraph 80

### RIBA House of the Year Longlist - EPC Data

Architect	Project name	Energy Efficiency Rating A - G	EPC Score	CO2 tonnes per year	Airtightness m3/m2h@50 pa.	Walls U-value	Roof U-value	Floor U-value	
ID Architecture	Barrow House (Wolds Barn)	B	83	4.1	3.7	0.27	0.13	0.17	
Wilkinson King Architects	Weybridge House	B	89	3.6	3.4	0.15	0.11	0.12	
Tonkin Liu	The Water Tower	B	90	1.1	1.3	0.15	0.12	0.13	
Sandy Rendel Architects	The Slot House	B	83	1	3.1	0.18	0.15	0.15	
John Pardey Architects	Narula House	B	82	3.4	4.7	0.11	0.13	0.18	
Woolacott Gilmartin Architects	Pele Tower House (Kentmere Hall)	D	60	11	-	-	-	-	
TYPE Studio	Redhill Barn (The Outfarm)	D	59	6.1	-	0.51	0.14	0.13	
ACME	Bumpers Oast	B	83	3	2.2	0.13	0.13	0.1	
John Pardey Architects	Ferry House (Harbour House)	B	81	3.1	2.9	0.18	0.16	0.15	
Turner Works	Hove House	B	86	5.5	4.7	0.17	0.13	0.12	
Tigg + Coll Architects	House for Theo and Oskar (Dalewood)	No current EPC registered							
Mary Arnold-Forster	House in Assynt (Cala)	C	70	4	3	0.14	0.14	0.14	
McLean Quinlan	The Walled Garden Farringdon	A	101	-1.3	0.6	0.1	0.1	0.11	
31/44 Architects	Corner House	B	85	1.4	3.2	0.24	0.2	0.15	
alma-nac	House-within-a-house	C	78	1.6	-	0.13	0.15	0.13	
AlisonBrooks Architects	Windward house (House on a Hill)	No current EPC registered							



### 6.3 EPC RESEARCH - HAWKES PROJECTS

CONTINUED RESEARCH INTO BUILDING PERFORMANCE



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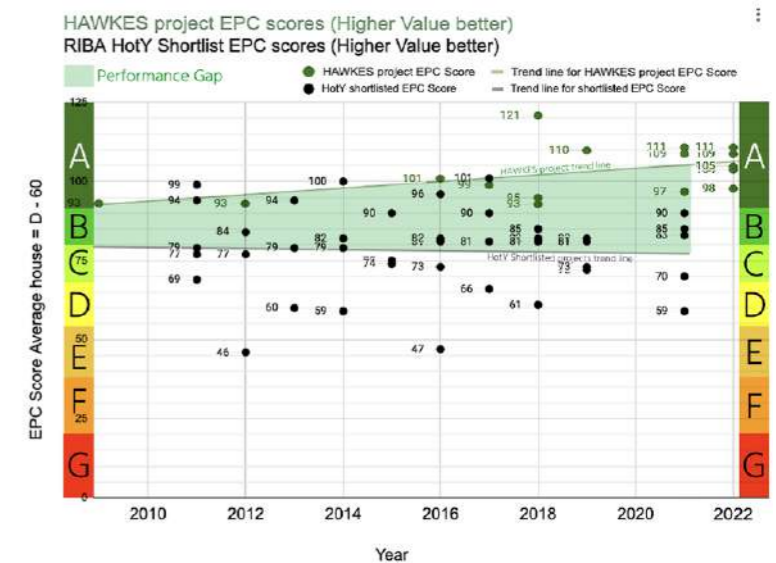
### HAWKES PROJECTS BUILT SINCE 2008

			Energy Efficiency Rating (EER) A - G	EPC Score Average house = D - 60	CO2 emissions Tonnes / Year (Lower value better) (An average house produces 6.0 tonnes / year)	Airtightness m3/m2h@50pa. (Lower value better)	Walls	Roof	Floor				EPC Ratings	EPC Score	AVERAGE % REDUCTION in DER compared to the TER as required under Part L1A (2013)
<b>HAWKES PROJECT AVERAGES</b>			<b>A</b>	<b>102.9</b>	<b>-3.6</b>	<b>1.8</b>	<b>0.13</b>	<b>0.12</b>	<b>0.11</b>				<b>A</b>	<b>92+</b>	<b>124</b>
													<b>B</b>	<b>81-91</b>	
<b>PROJECTS BY OTHERS AVERAGES</b>			<b>C</b>	<b>78.9</b>	<b>4.9</b>	<b>4.0</b>	<b>0.19</b>	<b>0.14</b>	<b>0.14</b>				<b>C</b>	<b>69-80</b>	
													<b>D</b>	<b>55-68</b>	
													<b>E</b>	<b>39-54</b>	
													<b>F</b>	<b>21-38</b>	
													<b>G</b>	<b>1-20</b>	
			EPC				Thermal Envelope Performance U-value W/m2K (Lower value wins)								
Project name	Project Postcode	Year built	Energy Efficiency Rating (EER) A - G	EPC Score Average house = D - 60	CO2 emissions Tonnes / Year (Lower value better) (An average house produces 6.0 tonnes / year)	Airtightness m3/m2h@50pa. (Lower value better)	Walls	Roof	Floor	Total Floor Area / m2	TER (Building Emissions Rate) CO2 emissions kgCO2/m2/yr	DER (Building Emissions Rate) CO2 emissions kgCO2/m2/yr	BER (Building Emissions Rate) CO2 emissions kgCO2/m2/yr	% REDUCTION in DER compared to the TER as required under Part L1A (2013)	
Crossway Passive House	TN12 0JA	2009	A	93	-0.6	0.7	0.12	0.12	0.11	249	\	-0.60	-0.002		
Echo Barn	TN27 8JG	2017	A	99	-0.4	2.1	0.14	0.14	0.09	320	\	\	-0.001		
Weald Meadows (YTL)	TN6 3QP	2021	A	109	-5.7	1.9	0.11	0.12	0.09	430	22.75	-4.27	-0.013	119	
Meadow View	TN17 2AP		A	93	-0.7	0.4	0.14	0.14	0.13	232	\	11.24	-0.003		
Bigbury Hollow	CT2 9BJ	2022	A	104	-2.6	2	0.14	0.14	0.09	312	18.28	-8.31	-0.008	145	
Vision (The Leas)	CT14 8ER	2022	A	98	0.4	2	0.15	0.14	0.17	269	25.82	1.82	0.001	93	
Halfpenny House	TN27 8PU	2016	A	101	-3.3	2.5	0.12	0.12	0.09	346	\	\	-0.010		
Viewpoint	RH7 6PD	2018	A	121	-12.5	2.4	0.1	0.1	0.1	558	14.84	-20.05	-0.022	235	
Dunnit (Brooks Barn)	RH13 0JN	2019	A	110	-12.22	1.8	0.12	0.11	0.11	593	17.49	-11.98	-0.021	168	
Headlands	GL52 3NL	2018	A	95	1.2	1.94	0.14	0.12	0.12	292	22.15	4.65	0.004	79	
Friisham Quarry	RG18 9UY	Consent 2018	A	93	3.515	2	0.14	0.11	0.12	710	21.14	4.95	0.005	77	
The Linhay	EX17 1BW	Design Stage	A	111	-8.22	2	0.12	0.12	0.11	303	24.11	-8.22	-0.027	134	
Red Oaks (Whitchurch Hill)	RG8 7QL	Design Stage	A	97	2.62	2	0.14	0.11	0.12	328	27.32	2.62	0.008	90	
Sherfield English	SO51 6FL	Design Stage	A	109	-12.23	2	0.12	0.12	0.11	325	16.38	-12.23	-0.038	175	
Friars Bourne	LU5 6AB	Design Stage	A	105	1.6	2	0.12	0.11	0.12	648	27.11	4.39	0.002	84	
Chadlington (Tunwold)		Design Stage	A	111	-2.8	2	0.12	0.11	0.11	707	19.35	-2.78	-0.004	114	
Foxbury	PO10 8RG	Design Stage	A	101	-0.735	2	0.14	0.11	0.12	1121	19.44	-0.66	-0.001	103	

This data base of information taken from SAP/EPC assessments of projects by Hawkes Architecture, shows that the average percentage reduction in CO2 emissions between the Target Emissions Rate (TER) and Dwelling Emission Rate (DER), beyond building regulations Part L1a (2013) is an average of 124%.

The lowest percentage reduction of any project undertaken by Hawkes Architecture is a 77% reduction of DER when compared to TER.

A suggested planning condition to ensure a TER to DER reduction of no less than 50% would clearly not be a problem given that every single Hawkes project has significantly exceeded this requirement.





# 6.4 EPC RESEARCH - ALL PROJECTS

## CONTINUED RESEARCH INTO BUILDING PERFORMANCE



Land adjacent to Wild Duck, Ewen, Cirencester GL7 6BY

### NOTABLE/AWARD WINNING PROJECTS BUILT OVER THE LAST 10 YEARS

Architect	Project name	Project Postcode	Year built	EPC Energy Efficiency Rating (EPC)	EPC Score Average (EPC)	CO2 emissions (kg CO2e/m <sup>2</sup> /year)	Airtightness (m <sup>3</sup> /h/m <sup>2</sup> @ 0.05 Pa)	Walls	Roof	Floor	Thermal Envelope Performance (U-value)
<b>RIBA House of the Year 2021 Shortlist</b>											
Urbanista	The Water Tower	PE30 2PP	2011	B	39	1.1	1.3	5.76	0.12	0.16	
David Huxford Architects	The 5th House	SL11 6AP	2011	B	81	1	3.1	3.38	0.15	0.11	
TPS Studio	Redhill Barn (The Outlines)	TQ9 7DA	2011	D	59	6.1	Not tested	3.51	0.14	0.13	
Yip + Co Architects	House of the 3rd Order (Oakwood)	KT20X 8X	2011	-	-	-	-	-	-	-	-
Ben Appleby Partner	House in Ascent (Cala)	TY2 1NAN	2011	C	79	4	3	5.4	0.14	0.14	
Alan Brink Architects	Whitwick House (Mosses or Moss)	SL11 6SW	2011	-	-	-	-	-	-	-	-
CPA Architects	Conner House	SL13 9NW	2011	B	85	1.4	3.2	3.04	0.14	0.10	
<b>PROJECT AVERAGES</b>											
				C	77.4	2.7	2.7	0.34	0.15	0.14	
<b>RIBA House of the Year 2021 remaining longlist</b>											
W. Huxford Architects	Barrow House (Barrow Bay)	SK31 0DY	2011	B	83	4.1	3.7	3.27	0.13	0.17	
Walter and Welford Architects	Weybridge House	KT11 5TG	2011	B	89	3.6	3.4	5.16	0.11	0.12	
Walter and Welford Architects	Simple House	2011									
Walter and Welford Architects	Paula House	RD11 8LH	2011	B	82	3.4	4.7	3.11	0.13	0.11	
Walter and Welford Architects	Five Tower House (Westmore Hall)	LA6 5JL	2011	D	69	11	N/A	N/A	N/A	N/A	
Walter and Welford Architects	The Old School	YO63 3PA	2011								
Walter and Welford Architects	Kyle House	IV21 4Y	2011								
Walter and Welford Architects	Bumpers Court	TK12 0AG	2011	B	83	3	2.2	5.33	0.13	0.13	
Walter and Welford Architects	Ferry House (Barrow Bay)	PO11 0DB	2011	B	81	3.1	2.9	3.38	0.16	0.13	
Walter and Welford Architects	Three House	BN1 6TH	2011	B	86	5.5	4.7	3.17	0.13	0.13	
Walter and Welford Architects	Strain House	W14 4P	2011	Expired							
Walter and Welford Architects	The Water Garden Farmington	EX41 2AH	2011	A	101	-1.3	0.5	0.1	0.1	0.11	
Walter and Welford Architects	House in Ascent	SK14 2JL	2011	C	78	1.6		5.13	0.15	0.14	
<b>PROJECT AVERAGES</b>											
				C	80.5	3.4	3.0	0.19	0.14	0.14	
<b>RIBA House of the Year 2019 Shortlist</b>											
McLoughlin Architects	House Lessons	BT24 7DF	2019	B	82	4.1	2.7	3.36	0.17	0.11	
McLoughlin Architects	Nibrod Farm	G125 8BA	2019	C	72	0.6	2	3.13	0.11	0.12	
McLoughlin Architects	Rocked House	SE27 6RS	2019	B	81	1.7	3.6	3.34	0.13	0.17	
McLoughlin Architects	Spacious Retreat	TQ12 2NL	2019	C	73						
McLoughlin Architects	Starlet Retreat	BR1 8RE	2019	None Listed that we can find							
<b>PROJECT AVERAGES</b>											
				C	77.0	2.1	2.8	0.17	0.15	0.13	
<b>RIBA House of the Year 2019 remaining longlist</b>											
McLoughlin Architects	Clark House	SL4 6BU	2019	C	75	0.3	5.7	0.1	0.11	0.13	
McLoughlin Architects	Earl's Court House	2019									
McLoughlin Architects	The Block House	IV45 8RS	2019	C	73	4	3	3.11	0.12	0.11	
McLoughlin Architects	The Great House	CV38 4BT	2019	C	76	5.4	1.4	5.36	0.15	0.18	
McLoughlin Architects	The Green House	SL16 7QD	2019	B	89	1.8	4.8	5.18	0.13	0.15	
McLoughlin Architects	Rampside House	2019									
McLoughlin Architects	James Gold	W14 4P	2019	D	64	5.6	Not tested	5.16	0.17	0.18	
McLoughlin Architects	18th House (2019)	SN7 3HF	2019	B	88	1.3	0.5	3.02	0.11	0.11	
McLoughlin Architects	House in Ascent	2019									
McLoughlin Architects	Warwood Lane House	2019									
McLoughlin Architects	Lark Flax	HP17 0XS	2019	A	94	0.7	0.5	4.13	0.08	0.08	
McLoughlin Architects	Silver Now	NP18 1L7	2019	C	78	4.2	Not tested	5.18	0.11	0.14	
McLoughlin Architects	South London House	SE8 3PH	2019	B	87	1.3	2.9	5.16	0.17	0.13	
McLoughlin Architects	Backyard	OX4 4NA	2019	C	78	2.1	4.7	5.19	0.13	0.11	
<b>PROJECT AVERAGES</b>											
				C	79.1	2.5	2.9	0.15	0.14	0.14	
<b>RIBA House of the Year 2018 Shortlist</b>											
Walter and Welford Architects	Phoenicia	RG4 3BL	2017	D	61	0	Not tested	3.13	0.14	0.11	
Walter and Welford Architects	Flad House	SE22 0RS	2017	B	85	1.6	5.4	3.34	0.13	0.08	
Walter and Welford Architects	Coastal House	2017									
Walter and Welford Architects	Towers House (2018)	YO26 8SS	2017	D	61	9.5	Not tested				
Walter and Welford Architects	Lockwood House	W22 2EX	2017	B	85	0.7	1.9	3.13	0.08	0.14	
Walter and Welford Architects	Vix House	NW1 7ST	2017	B	82	1.9	2.5	3.26	0.17	0.11	
Walter and Welford Architects	The Makers House	SN7 3PS	2017	B	81	3.2	Not tested	3.13	0.13	0.14	
<b>PROJECT AVERAGES</b>											
				C	75.6	4.3	3.3	0.19	0.13	0.13	
<b>RIBA House of the Year 2017 Shortlist</b>											
Walter and Welford Architects	Caring Wood	ME17 1TA	2016	A	101	-0.5	1	3.11	0.09	0.09	
Walter and Welford Architects	Shoven House	NE45 2TA	2016	D	66	1.1					
Walter and Welford Architects	None Listed that we can find	2016									
Walter and Welford Architects	4 Wood Lane	M5 5UB	2016	None Listed							
Walter and Welford Architects	Hatten House	EC1R 1LJ	2016	None Listed that we can find							
Walter and Welford Architects	The Quest	BN19 2JF	2016	B	99	1.1	3.3	5.14	0.13	0.14	
Walter and Welford Architects	None Listed that we can find	2016									

Architect	Project name	Project Postcode	Year built	EPC Energy Efficiency Rating (EPC)	EPC Score Average (EPC)	CO2 emissions (kg CO2e/m <sup>2</sup> /year)	Airtightness (m <sup>3</sup> /h/m <sup>2</sup> @ 0.05 Pa)	Walls	Roof	Floor	Thermal Envelope Performance (U-value)
<b>PROJECT AVERAGES</b>											
				B	79.8	1.9	4.1	0.15	0.15	0.14	
<b>RIBA House of the Year 2016 Shortlist</b>											
Ernest Worby	Murphy House	EH1 3KH	2015	B	81	2.9	Not tested	0.18	0.18	0.10	
Loyn & Co	Outhouse	NP19 7NJ	2015	A	96	1.5	0.49	6.1	0.15	0.09	
Ernest Worby	Tin House	W12 8JW	2015	B	82	2.4	4.1	0.11	0.11	0.14	
Holland & Co	Garden House	W14 8DG	2015	None Listed							
Loyn & Co	Modern House	W2 3DY	2015	C	73						
Loyn & Co	Covent House	SW4 6LT	2014	None Listed							
Loyn & Co	Andy Park	SP3 9AG	2015	E	47	8.7					
<b>PROJECTS BY OTHERS AVERAGES</b>											
				C	76.8	3.9	2.3	0.13	0.15	0.13	
<b>RIBA House of the Year 2015 Shortlist</b>											
Seem Catterall Architects	Blind House	HP18 2JF	2014	C	74	7.8	4.8	0.18	0.13	0.12	
Seem Catterall Architects	Cafe Canal	SL3 0BA	2014	C	75	3.3	1.5	0.21	0.13	0.11	
Seem Catterall Architects	Three Storey House	TK9 6WZ	2015	B	90	0.7	6.7	0.11	0.11	0.09	
McLoughlin Architects	House at Maynes	BT3 1JS	2014	None Listed							
Walter and Welford Architects	Laying House	WC1N 2PG	2011	C	74	5.5					
Walter and Welford Architects	The 181, Brookside	2011									
Walter and Welford Architects	Valley House, London	2011									
<b>PROJECTS BY OTHERS AVERAGES</b>											
				C	78.3	5.1	6.8	0.17	0.15	0.10	
<b>RIBA House of the Year 2014 Shortlist</b>											
Loyn & Co	Stormy Castle	SA3 1DF	2013	A	100	-0.5	1.3	0.15	0.13	0.1	
Loyn & Co	GH House	W55 8ZJ	2011	C	79	2.4	5.6	0.24	0.11	0.11	
Alan Brink Architects	The Kerch	PO11 0GQ	2011	D	59	3.1	10	0.36	0.2	0.14	
Alan Brink Architects	Lane House	N13 3JL	2012	None Listed							
Alan Brink Architects	Laker House	SN13 8XK	2010	B	82	4	Not tested	0.21	0.22	0.16	
Alan Brink Architects	Bracken Cottage (House No. 1)	PA77 4UL	2012	None Listed							
<b>PROJECTS BY OTHERS AVERAGES</b>											
				C	80.0	2.3	5.8	0.23	0.16	0.13	
<b>RIBA House of the Year 2013 Shortlist</b>											
Carl Turner Architects	Sig House	SN2 5EA	2012	A	94	1	1.5	0.13	0.11	0.11	
BRM Architects	Quarry House	GU21 5RL	2012	D	60	15	Not tested				
Walter and Welford Architects	Bank Mount	CH48 2JL	2012	C	79	7.3	5.9	0.14	0.13	0.1	
Walter and Welford Architects	Cowbrook	SO12 1NU	2012	G	18	14					
Walter and Welford Architects	Asley Castle	CV10 1GN	2012	None Listed							
<b>PROJECTS BY OTHERS AVERAGES</b>											
				D	62.8	9.3	3.7	0.15	0.12	0.16	
<b>RIBA House of the Year 2012 Shortlist</b>											
Walter and Welford Architects	22 Haydock Rd	SE13 3AH	2011	B	86	1.8	4.6	0.15	0.16	0.11	
Walter and Welford Architects	Meat House	SE18 8AL	2011	B	83	2.7	6.1	0.26	0.14	0.13	
Walter and Welford Architects	Leaf House	NE47 4JP	2011	B	91	1.1	0.4	3.1	0.08	0.08	
Walter and Welford Architects	Big Holloway	SL8 5HD	2011	B	82	3.1	2.1	3.2	0.19	0.19	
Walter and Welford Architects	The Old Water Tower	RG29 8TF	2011	B	83	2	0.6	5.09	0.01	0.09	
Walter and Welford Architects	Shree House (West Down)	TN15 0ND	2011	B	81	6.7	5.8	0.14	0.14	0.14	
Walter and Welford Architects	Parron One House	CF5 6E2	2011	E	49	13	Not tested				
Walter and Welford Architects	123 Cheyenne Walk	SW19 0EG	2011	B	82	3.5	4.8	0.19	0.13	0.18	
Walter and Welford Architects	The Tolled House	W14 6LA	2011	B	83	3.1	7.5	0.24	0.16	0.14	
Walter and Welford Architects	Solar House	LA22 1NH	2011	B	86	2.2	2.9	0.17	0.18	0.12	
Walter and Welford Architects	House in Ascent (West House)	SL8 6PN	2011	A	97	0.6	2.6	0.16	0.13	0.15	
Walter and Welford Architects	Drop Wks Barn	HP11 0JF	2011	C	77	0.7	5.1	0.12	0.09	0.08	
Walter and Welford Architects	The Old Farm	HP11 0NE	2011	C	75	14	Not tested	0.2	0.2	0.2	
Walter and Welford Architects	Gilgarragh	TR3 6SE	2011	C	72	4.9	5.1	0.17	0.2	0.11	
Walter and Welford Architects	Lloyd House	TH17 1HU	2010	A	94	1.2	4.1	0.8	0.13	0.13	
Walter and Welford Architects	Pulzarth House	PL27 6JG	2010	C	79	9	3	0.1	0.15	0.11	
Walter and Welford Architects	House in Stratford-on-Avon (Aberdeen/Adams)	M10 9AW	2010								
Walter and Welford Architects	188 House	BN7 3PP	2011								



# 6.5 NOTABLE AND AWARD WINNING PROJECTS - SAP PORTFOLIO

CONTINUED RESEARCH INTO BUILDING PERFORMANCE

OTHERS AVERAGE SCORE- 80.6

# EWEN

Land adjacent to Wild Duck, Ewen, Cirencester GL7 6BY

**FAYLAND HOUSE**  
(C - 76)

**QUINTAIN HOUSE**  
(C - 72)

**CARING WOOD**  
(A - 101)

**LOCHSIDE HOUSE**  
(B - 85)

**HOUSE LESSANS**  
(B - 82)

**BARROW HOUSE**  
(B - 83)

**FLINT HOUSE**  
(C - 74)

**THE WATER TOWER**  
(B - 90)

**NARULA HOUSE**  
(B - 82)

**BUMPERS OAST**  
(B - 83)

**FERRY HOUSE**  
(B - 81)

**HOVE HOUSE**  
(B - 86)

**CALA HOUSE**  
(C - 70)

**THE WALLED GARDEN FARRINGTON**  
(A - 101)

**MURPHY HOUSE**  
(B - 81)

**SECULAR RETREAT**  
(C - 73)

**CORK HOUSE**  
(C - 75)

**GHOST HOUSE**  
(C - 76)

**HANDSMOOTH HOUSE**  
(A - 96)

**PHEASANTS**  
(D - 61)



**6.6 HAWKES ARCHITECTURE SAP PORTFOLIO**  
CONTINUED RESEARCH INTO BUILDING PERFORMANCE

**HAWKES AVERAGE SCORE - 102.4 (A)**

**EWEN**

Land adjacent to Wild Duck, Ewen, Cirencester GL7 6BY

On completion of all Hawkes Architecture projects an as-built SAP calculation is carried out. This has shown the houses built by Hawkes consistently achieve scores of over 100. Far above the standard.

Action: Carry out as built SAP calculation on completion of the dwelling.



**FOXBURY (A - 109)**



**TUNWOLD (A - 111)**



**HERNHILL (A - 100)**



**APPROVED DWELLING 18/0051/FUL (A - 102)**



**CROSSWAY (A - 93)**



**MEADOW VIEW (A - 93)**



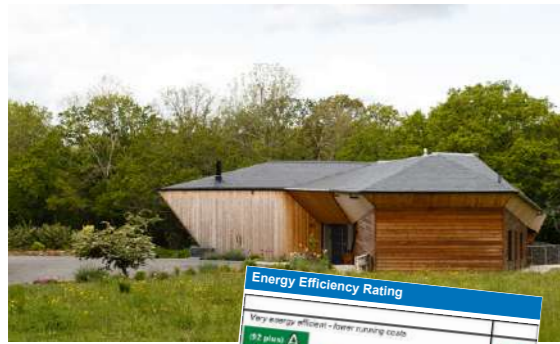
**ECHO BARN (A - 99)**



**HEADLANDS (A - 95)**



**HALFPENNY HOUSE (A - 101)**



**BROOKS BARN (A - 110)**



**VIEWPOINT (A - 121)**



**LAKE HOUSE (A - 109)**



**THE LEAS (A - 98)**



**BIGBURY HOLLOW (A - 104)**



**SHERFIELD ENGLISH (A - 109)**



**WHITCHURCH HILL (A - 97)**



**WEST EFFORD LINHAY (A - 111)**



**FRILSHAM QUARRY (A - 93)**



**FRIARS BOURNE (A - 105)**

**RIDGE**  
Property and Construction Consultants

**DAVIES LANDSCAPE ARCHITECTS**

**HAWKES**  
architecture



## 6.7 SUMMARY

# EWEN

Land adjacent to  
Wild Duck,  
Ewen, Cirencester  
GL7 6BY

### SUMMARY

- The site is contained within a currently managed woodland.
- The myriad of landscape enhancements and the exceptional building design would significantly enhance the immediate setting of this site.
- The proposal will ensure the repair, maintenance and restoration of the existing woodland character within the site.
- The proposal takes into account the main site characteristics referencing the trees with its architectural language to minimise the building impact on the woodland floor.
- The proposal contains and controls domestic amenity space, ensuring no future 'sprawl.'
- The approved dwelling together with the two 'Annexes' will allow the family to stay close together. It will provide a multi-generational living.

