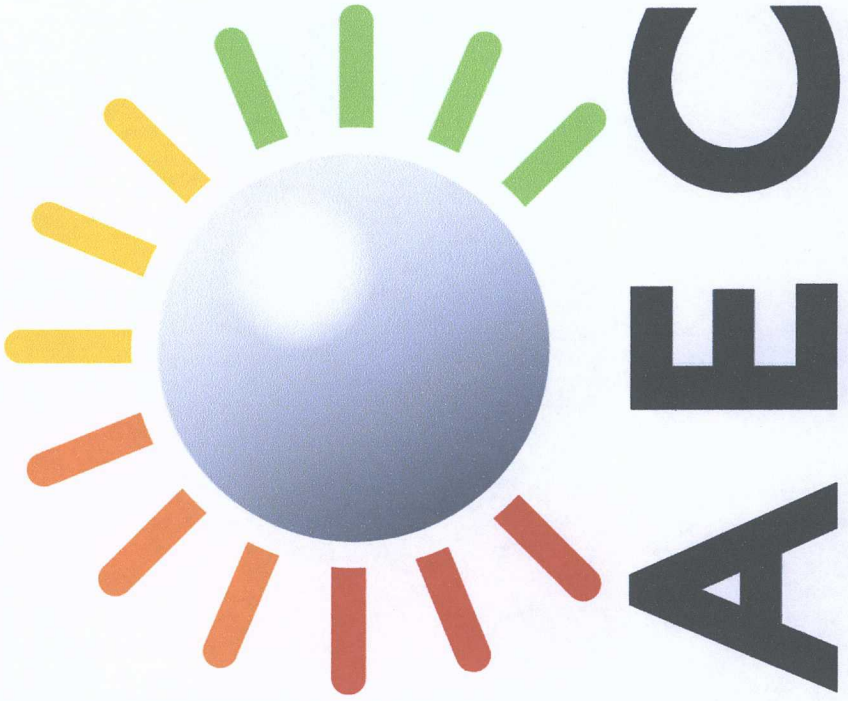
DISCONS



Anglia Energy Consultants

SAP 2009 Calculation

Project No:	**AEC 11-602**
Project Address:	New dwelling land rear of 36 Grove Road, Burbage, Leicestershire.
Client:	AXONBECKETT
Date:	21st February 2011

Anglia Energy Consultants Limited
6 St Edmunds Road, Downham Market, Norfolk PE38 9LP Phone: 01366 320168
E-mail: angliaenergyconsultants@hotmail.co.uk Limited Company Reg. No. 06161857

Contents:

Section 1	Introduction
Section 2	Results
Section 3	Building Regulations Compliance Calculation Sheets
Section 4	Design Input and Results

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E-mail: angliaenergyconsultants@hotmail.co.uk Limited Company Reg. No. 06161857

Section 1 - Introduction

The SAP energy rating has been devised as a simple and easy to understand method of measuring the overall energy efficiency of a property. It is the government recommended system for producing a home energy rating. The SAP is based on the Energy Cost Factor (ECF) based on the calculated annual energy cost for space heating, water heating, ventilation and lighting. It is adjusted for floor area so that it is essentially independent of dwelling size for a given built form. The SAP is now expressed on a scale of 1 to 100, the higher the number the lower the running costs. SAP ratings above 100 can be achieved by dwellings that are net exporters of energy, i.e. those that through renewable technologies are able to sell excess electricity back to the national grid. SAP ratings are rounded to the nearest integer.

This design stage report involves the calculation of an energy efficiency assessment to assess compliance with Approved Document L1A 2010. It is based solely on the information provided by the designer, any assumptions that have had to of been made are detailed in the report. This report will form part of the submission to Building control to achieve approval under Building Regulations.

Section 2 - Results

As Designed standard gas boiler

SAP Rating: 77C **DER: 21.40 < TER:17.55**

Result: Fail

As Designed standard gas boiler with solar panels

SAP Rating: 81b **DER: 17.42 < TER:17.55**

Result: Pass

As Designed with air source heat pump

SAP Rating: 71c **DER: 24.52 < TER:29.75**

Result: Pass

As Designed standard gas boiler with PV (photovoltaic panels)

SAP Rating: 83b **DER: 16.49 < TER:17.55**

Result: Pass

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Project particulars

The following drawings and information has been used in the preparation of this energy assessment:

10981-CN01A,02A,03A

Information relating to the property is retained on our computer data files for future evaluations.

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Key information to achieve compliance

The following items form an important part of achieving compliance and should be noted by builder, designer, building control body and owner.

1. The wood burner (HETAS approved) shall be installed.
2. The default value for thermal bridging has been used in this calculation as there is no information available regarding thermal bridging.
3. A design air permeability of not worse than $4m^3/(h.m^2)$ at 50 Pa
4. Builder must follow architects details and specification for all materials unless of higher specification and Boiler/heating specification as any changes made will affect the results of the SAP calculation.
5. Fixed dedicated low energy light fittings must be provided throughout the property (100%)

   Light fittings (including lamp, control gear and an appropriate housing, reflector, shade or diffuser or other device for controlling the output light) should only take lamps having a luminous efficacy greater than 40 lumens per circuit-watt.
6. Heating system and controls in accordance with the Domestic heating guide.
7. Installation of a Gas condensing boiler with a minimum SEDBUK rating of 91% (SEDBUL 2009) or greater required. Heating system and controls installed in accordance with the domestic building compliance guide.
8. Solida door to achieve a u-value of no more than 1.8w/m2K.
9. No other assumptions made, all information taken from supporting documentation.

Robust Construction Details

The default value for thermal bridging has been used in this calculation as there is no information available regarding thermal bridging.

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Assumptions Made

1. A wood burner (HETAS approved) is installed in the lounge.
2. Gas condensing boiler with minimum Sedbuk 2009 rating of at least 90% required.
3. Default value for thermal bridging used.
4. Front solid door to achieve no worse than 1.8w/m2K.
5. No other assumptions made, all information taken off of the plans and supporting documents.

Domestic Building Compliance Guide

All heating and hot water controls must be specified and installed in accordance with the Domestic Building Compliance Guide in order to comply with the Building Regulations. If you are unsure please contact your Building Control Body.

Air Pressure Tightness Testing

This report has been based on an air permeability rate of 4$m^3/(h.m^2)$ at 50 Pa. Air leakage requirements must be satisfied by pressure testing at completion of the works and must not be worse than the quoted rate. We can advise further as to air permeability if required. A copy of the pressure test report for the dwelling tested must be provided to us at completion.

The designer must satisfy themselves that the trickle ventilation provision is in accordance with A.D Part F of the Building Regulations to allow for the air pressure test figure. If any doubt the figures from part A of Table 5.2a should be used to account for a possible different pressure test result at completion.

As Built Stage

As you will see in the Approved Document L1A Checklist items 2.2, 2.6 to 2.8 and 4.2 to 4.7 require a 'Builders Submission'. Documentary evidence for these items (e.g. air pressure test reports, benchmark logbook etc) must be provided to us prior to completion to enable us to supply the EPC (energy performance certificate). We will also need to know of any changes to the construction of the building or insulation type/thickness provided. Boiler make and model number is required, correct postal address and a copy of the air pressure test certificate. Although AEC will Endeavour to supply the EPC at the earliest opportunity however please allow up-to two weeks for recalculation, confirmation of address by Landmark, lodgment and supply of EPC. Please also note our fees are based on a construction period of 18 months from issue of the SAP calculation. We may be unable to produce EPC's requested after this time due to changes in software etc. A further charge may also be applicable due to conversion requirements for later upgrades to the SAP software or major recalculation due to changes during the construction phase.

Background Ventilation Provision

It is important to remember that the background ventilation provision is directly effected by the air pressure test result. In order to prevent problems at completion building designers should consider designing the total amount in accordance with Table 5.2a Part A.

Our Recommendations

It is important to remember that any changes in the design or materials used can have a detrimental effect on the energy assessment and therefore become costly in trying to then achieve compliance. Therefore we strongly recommend that if any changes are proposed please consult us to enable a recalculation to be carried out. It is equally important to inform us of any increases in the specification of material used on site as this will therefore improve the overall rating and improve the dwellings marketability.

Definitions

SAP -Standard Assessment Procedure
DER - Dwelling CO2 Emissions Rate
TER - Target CO2 Emissions Rate
EI - Environmental Impact
EPC – Energy Performance Certificate

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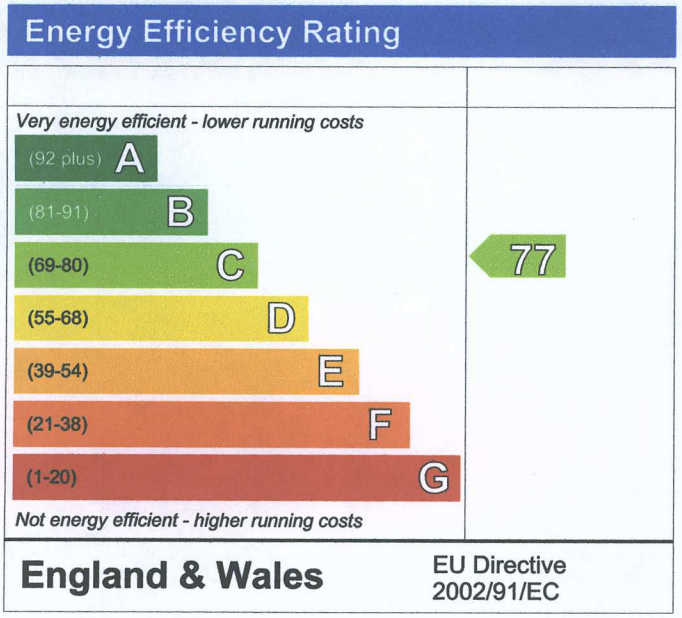
Predicted Energy Assessment

Land rear of 36, Grove Road,
Burbage,
Hinckley,
Leicestershire,
LE10 2

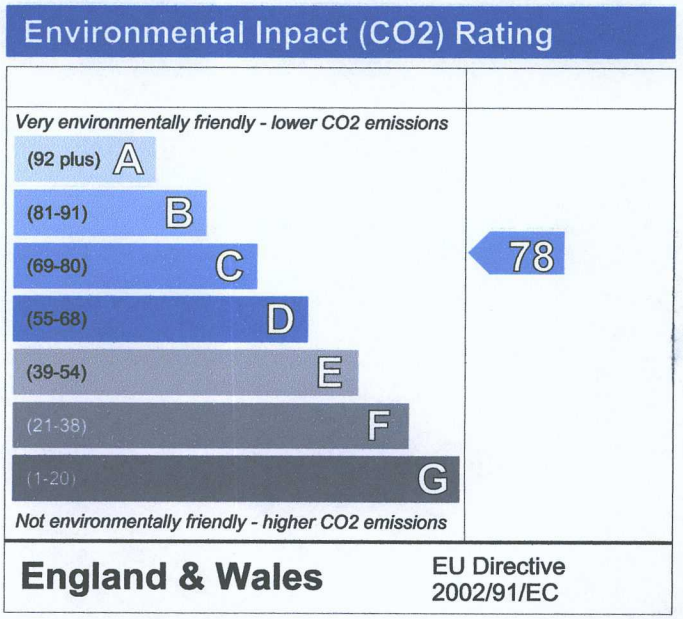
Dwelling type:	House, Detached
Date of assessment:	21.Feb.2011
Produced by:	Anglia Energy Consultants Ltd
Total floor area:	188.6 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2009 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.

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Predicted Energy Assessment

Land rear of 36, Grove Road,
Burbage,
Hinckley,
Leicestershire,
LE10 2

Dwelling type:	House, Detached
Date of assessment:	21.Feb.2011
Produced by:	admin admin
Total floor area:	188.6 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

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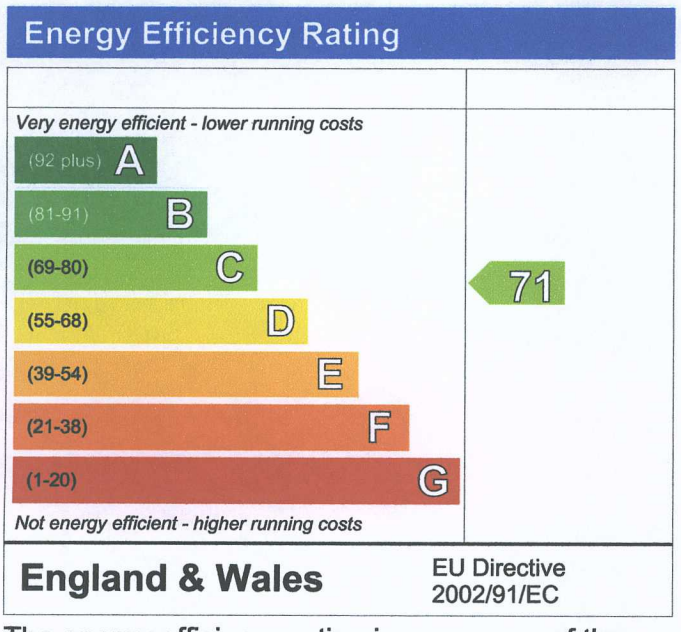

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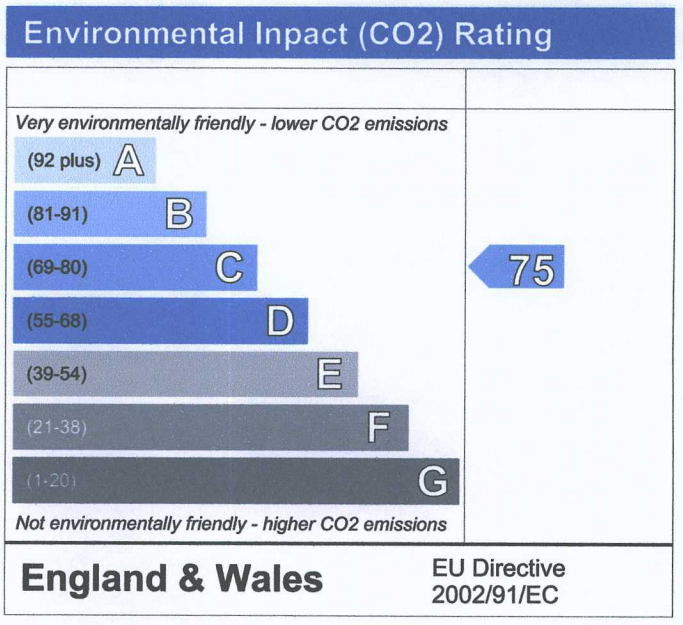

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Predicted Energy Assessment

Land rear of 36, Grove Road,
Burbage,
Hinckley,
Leicestershire,
LE10 2

Dwelling type:	House, Detached
Date of assessment:	21.Feb.2011
Produced by:	admin admin
Total floor area:	188.6 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

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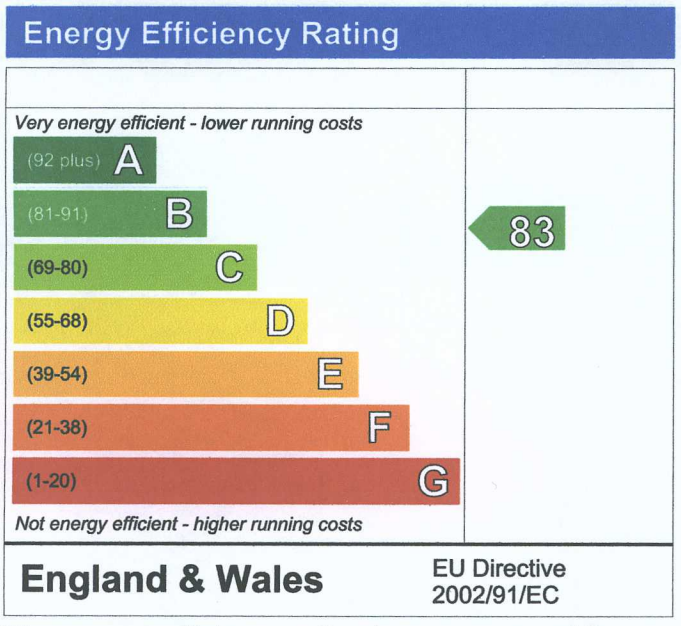

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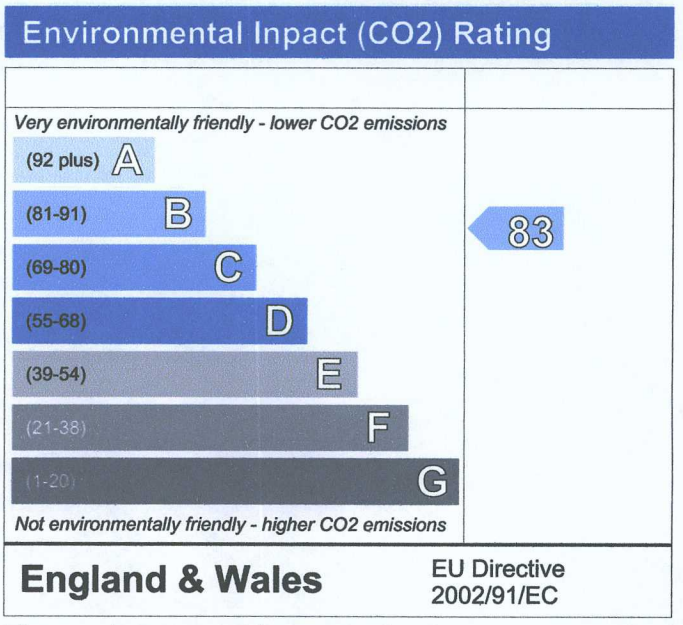

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Predicted Energy Assessment

Land rear of 36, Grove Road,
Burbage,
Hinckley,
Leicestershire,
LE10 2

Dwelling type:	House, Detached
Date of assessment:	21.Feb.2011
Produced by:	Anglia Energy Consultants Ltd
Total floor area:	188.6 m²

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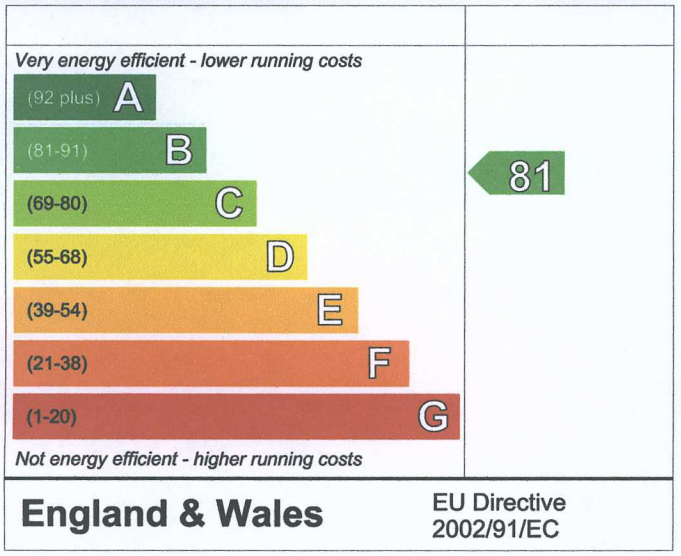
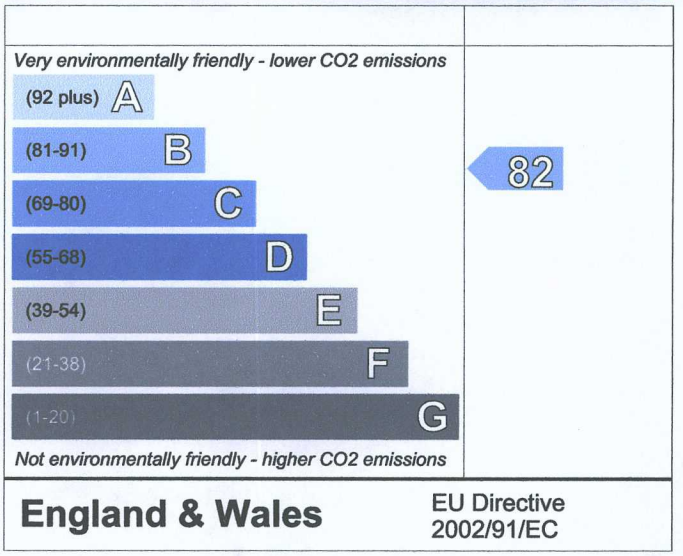
Energy Efficiency Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Inpact (CO2) Rating



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.

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Section 3 – Building Regulations Compliance Calculation Sheets

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E-mail: angliaenergyconsultants@hotmail.co.uk Limited Company Reg. No. 06161857

Building Regulation Compliance

Users Ref: 001 **Issued on:** 21.Feb.2011
EES Ref: 11-602 **Prop Type Ref:**
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2, **DER:** 21.40
TER: 17.55

SAP Rating:	77 C	**CO2 Emissions:**	3.83 t/year	**Fabric Energy:** 87.7		**Energy used:**	118 kWh/m²/year
EI Rating:	78 C	**SAP Energy Cost:**	£ 806.48	**HLP:**2.00	**Ene1:** 0	**ZC:**0.00	

Surveyor: Anglia Energy Cons., Tel: 01366 320168, Fax: (undefined)
Address: 6 St Edmunds Road, Downham Market, Norfolk, PE38 9LP
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1 TER and DER

Fuel for main heating:	Mains gas	
Fuel factor:	1.00 (mains gas)	
Target Carbon Dioxide Emission Rate (TER)	17.55 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	21.40 kg/m²	
Excess emissions	3.85 kg/m² (21.9%)	Fail

2 Fabric U-values

Element	Average	Highest	
External wall	0.28 (max. 0.30)	0.28 (max. 0.70)	OK
Floor	0.19 (max. 0.25)	0.19 (max. 0.70)	OK
Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.78 (max. 2.00)	3.00 (max. 3.30)	OK

3 Design air permeability

Design air permeability at 50 pascals:	8.00	
Maximum	10.0	OK

4 Heating efficiency

Main heating system:	Boiler system with radiators or underfloor - Mains gas Data from manufacturer as determined on site as determined on site Efficiency: 90.0% SEDBUK2009	
	Minimum: 88.0%	OK
Secondary heating system:	Room heaters - Wood Logs Closed room heat Efficiency: 65%	
	Minimum: 65%	OK

5 Cylinder insulation

Hot water storage	Nominal cylinder loss: 1.82 kWh/day	
	Permitted by DBSCG 2.10	OK
Primary pipework insulated:	Yes	OK

6 Controls

Space heating controls:	Time and temperature zone control	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK
Boiler interlock	Yes	OK

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7 Low energy lights

Percentage of fixed lights with low-energy fittings:	75%	
Minimum	75%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Midlands):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing North:	1.40 m², No overhang	
Windows facing East:	21.00 m², No overhang	
Windows facing South:	4.00 m², No overhang	
Windows facing West:	31.03 m², No overhang	
Ventilation rate:	8.00	
Blinds/curtains:	None	

10 Key features

Floor U-value	0.19 W/m²K
Secondary heating (wood logs)	
Secondary heating fuel:	wood logs

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Building Regulation Compliance

Users Ref: 002-air source heat pump
Issued on: 21.Feb.2011
EES Ref: 11-602
Prop Type Ref:
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2,
DER: 24.52
TER: 29.75

SAP Rating:	71 C	**CO2 Emissions:**	4.37 t/year	**Fabric Energy:**	82.7	**Energy used:**	142 kWh/m²/year
EI Rating:	75 C	**SAP Energy Cost:**	£ 1034.53	**HLP:**	1.91	**Ene1:** 1	**ZC:** 0.00

Surveyor: admin admin, Tel: unknown
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1 TER and DER

Fuel for main heating:	Electricity	
Fuel factor:	1.47 (electricity)	
Target Carbon Dioxide Emission Rate (TER)	29.75 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	24.52 kg/m²	OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.28 (max. 0.30)	0.28 (max. 0.70)	OK
Floor	0.19 (max. 0.25)	0.19 (max. 0.70)	OK
Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.74 (max. 2.00)	2.35 (max. 3.30)	OK

3 Design air permeability

Design air permeability at 50 pascals:	4.00	
Maximum	10.0	OK

4 Heating efficiency

Main heating system:	Heat pump with radiators or underfloor - Electric	
	Air-to-water heat pump	
Secondary heating system:	Room heaters - Wood Logs	
	Closed room heat	
	Efficiency: 65%	
	Minimum: 65%	OK

5 Cylinder insulation

Hot water storage	Nominal cylinder loss: 1.82 kWh/day	
	Permitted by DBSCG 2.10	OK
Primary pipework insulated:	Yes	OK

6 Controls

Space heating controls:	Time and temperature zone control	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings:	100%	
Minimum	75%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

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Overheating risk (Midlands):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing North:	1.40 m², No overhang	
Windows facing East:	21.00 m², No overhang	
Windows facing South:	4.00 m², No overhang	
Windows facing West:	31.03 m², No overhang	
Ventilation rate:	8.00	
Blinds/curtains:	None	

10 Key features

Floor U-value	0.19 W/m²K
Design air permeability	4.0 m³/m²h
Secondary heating (wood logs)	
Secondary heating fuel:	wood logs

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Building Regulation Compliance

Users Ref: 003-pv panels
Issued on: 21.Feb.2011
EES Ref: 11-602
Prop Type Ref:
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2,
DER: 16.49
TER: 17.55

SAP Rating:	**83 B**	**CO2 Emissions:**	2.92 t/year	**Fabric Energy:** 82.7	**Energy used:**	90 kWh/m²/year	
EI Rating:	**83 B**	**SAP Energy Cost:**	£ 622.08	**HLP:**1.91	**Ene1:** 4	**ZC:**0.00	

Surveyor: admin admin, Tel: unknown
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1 TER and DER

Fuel for main heating:	Mains gas	
Fuel factor:	1.00 (mains gas)	
Target Carbon Dioxide Emission Rate (TER)	17.55 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	16.49 kg/m²	OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.28 (max. 0.30)	0.28 (max. 0.70)	OK
Floor	0.19 (max. 0.25)	0.19 (max. 0.70)	OK
Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.74 (max. 2.00)	2.35 (max. 3.30)	OK

3 Design air permeability

Design air permeability at 50 pascals:	4.00	
Maximum	10.0	OK

4 Heating efficiency

Main heating system:	Boiler system with radiators or underfloor - Mains gas Data from manufacturer as determined on site as determined on site Efficiency: 90.0% SEDBUK2009	
	Minimum: 88.0%	OK
Secondary heating system:	Room heaters - Wood Logs Closed room heat Efficiency: 65%	
	Minimum: 65%	OK

5 Cylinder insulation

Hot water storage	Nominal cylinder loss: 1.82 kWh/day	
	Permitted by DBSCG 2.10	OK
Primary pipework insulated:	Yes	OK

6 Controls

Space heating controls:	Time and temperature zone control	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK
Boiler interlock	Yes	OK

7 Low energy lights

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Percentage of fixed lights with low-energy fittings:	100%	
Minimum	75%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Midlands):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing North:	1.40 m², No overhang	
Windows facing East:	21.00 m², No overhang	
Windows facing South:	4.00 m², No overhang	
Windows facing West:	31.03 m², No overhang	
Ventilation rate:	8.00	
Blinds/curtains:	None	

10 Key features

Floor U-value	0.19 W/m²K
Design air permeability	4.0 m³/m²h
Secondary heating (wood logs)	
Secondary heating fuel:	wood logs
Photovoltaic array	

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Building Regulation Compliance

Users Ref: 001-solar panels **Issued on:** 21.Feb.2011
EES Ref: 11-602 **Prop Type Ref:**
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2, **DER:** 17.42 **TER:** 17.55

SAP Rating:	**81 B**	**CO2 Emissions:**	3.09 t/year	**Fabric Energy:** 82.7		**Energy used:**	96 kWh/m²/year
EI Rating:	**82 B**	**SAP Energy Cost:**	£ 684.82	**HLP:**1.91	**Ene1:** 0	**ZC:**0.00	

Surveyor: Anglia Energy Cons., Tel: 01366 320168, Fax: (undefined)
Address: 6 St Edmunds Road, Downham Market, Norfolk, PE38 9LP
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1 TER and DER

Fuel for main heating:	Mains gas	
Fuel factor:	1.00 (mains gas)	
Target Carbon Dioxide Emission Rate (TER)	17.55 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	17.42 kg/m²	OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.28 (max. 0.30)	0.28 (max. 0.70)	OK
Floor	0.19 (max. 0.25)	0.19 (max. 0.70)	OK
Roof	0.18 (max. 0.20)	0.18 (max. 0.35)	OK
Openings	1.74 (max. 2.00)	2.35 (max. 3.30)	OK

3 Design air permeability

Design air permeability at 50 pascals:	4.00	
Maximum	10.0	OK

4 Heating efficiency

Main heating system:	Boiler system with radiators or underfloor - Mains gas Data from manufacturer as determined on site as determined on site Efficiency: 91.0% SEDBUK2009 Minimum: 88.0%	OK
Secondary heating system:	Room heaters - Wood Logs Closed room heat Efficiency: 65% Minimum: 65%	OK

5 Cylinder insulation

Hot water storage	Nominal store loss: 2.38 kWh/day Permitted by DBSCG 3.11	OK
Primary pipework insulated:	Yes	OK

Solar water heating

Dedicated solar storage volume:	200 litres	
Minimum:	84 litres	OK

6 Controls

Space heating controls:	Time and temperature zone control	OK
Hot water controls:	Cylinderstat	OK

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	Independent timer for DHW	OK
Boiler interlock	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings:	100%	
Minimum	75%	OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (Midlands):	Not significant	OK
Based On:		
Overshading:	Average	
Windows facing North:	1.40 m², No overhang	
Windows facing East:	21.00 m², No overhang	
Windows facing South:	4.00 m², No overhang	
Windows facing West:	31.03 m², No overhang	
Ventilation rate:	8.00	
Blinds/curtains:	None	

10 Key features

Floor U-value	0.19 W/m²K
Design air permeability	4.0 m³/m²h
Secondary heating (wood logs)	
Secondary heating fuel:	wood logs
Solar water heating	

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Section 4 – Design Input and Results

Anglia Energy Consultants Limited
6 St Edmunds Road, Downham Market, Norfolk PE38 9LP Phone: 01366 320168
E-mail: angliaenergyconsultants@hotmail.co.uk Limited Company Reg. No. 06161857

Summary Information

Users Ref: 001 **Issued on:** 21.Feb.2011

EES Ref: 11-602 **Prop Type Ref:**

Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2, **DER:** 21.40 **TER:** 17.55

SAP Rating: 77 C **CO2 Emissions:** 3.83 t/year **Fabric Energy:** 87.7 **Energy used:** 118 kWh/m²/year

EI Rating: 78 C **SAP Energy Cost:** £ 806.48 **HLP:**2.00 **Ene1:** 0 **ZC:**0.00

Surveyor: Anglia Energy Cons., Tel: 01366 320168, Fax: (undefined)
Address: 6 St Edmunds Road, Downham Market, Norfolk, PE38 9LP
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2011
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Internal Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	46.8	96.8	2.4
1st Storey:	49.2	91.8	3.2

7.0 Living Area: 41

8.0 Thermal Mass Parameter: Simple calculation

9.0 External Walls

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
External Wall 1	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.28		70.00	257.40	198.57

10.0 External Roofs

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
sloping roof sections	Plasterboard, insulated slope	0.18		9	93.39	90.79
flat sections of roof	Plasterboard, insulated at ceiling level	0.16		9	13.90	13.90

11.0 HeatLoss Floors

Description	Construction	U-Value	Element	Kappa	Area
Heat Loss Floor 1	Suspended concrete floor, carpeted	0.19		75	96.80

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Opening Type 1	SAP table	Half Glazed Door	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	2.35
Opening Type 2	SAP table	Solid Door			No	0		0	3.00
Opening Type 3	SAP table	Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	1.70
Opening Type 4	SAP table	Roof Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	Wood	0.7	2.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width	Height	Count	Area	Curtain Closed
west elev windows	Window - Opening Type 3	External Wall 1	West	None	0	No	0	0	1	29.43	0
west elev rooflights	Roof Window - Opening Type 4	sloping roof sections	West	None	0	No	0	0	1	1.60	0

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north elev windows	Window - Opening Type 3	External Wall 1	North	None	0	No	0	0	1	1.40	0
north elev door	Half Glazed Door - Opening Type 1	External Wall 1	North	None	0	No	0	0	1	1.90	0
south elev windows	Window - Opening Type 3	External Wall 1	South	None	0	No	0	0	1	4.00	0
east elev windows	Window - Opening Type 3	External Wall 1	East	None	0	No	0	0	1	20.00	0
east door	Solid Door - Opening Type 2	External Wall 1	East	None	0	No	0	0	1	2.10	0
rooflights east	Roof Window - Opening Type 4	sloping roof sections	East	None	0	No	0	0	1	1.00	0

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.15
18.0 Pressure Testing	Yes
Designed q50	8.00
Mechanical Ventilation System Present	No
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	8.00

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0	0	1	1
Number of open flues	0	0	0	0
Number of intermittent fans				5
Number of passive vents				0
Number of flueless gas fires				0

21.0 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	15
Percentage of L.E.L. fittings	75.00
External	
External lights fitted	No
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	notional gas boiler
Percentage of Heat	100.00
Main Heating 2	None
Secondary Heating	SAP table
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery System 1	No
Waste Water Heat Recovery System 2	No
Solar Panel	No
25.0 Main Heating 1	
Main Heating	BGB
SAP Code	102
Efficiency (Sedbuk 2009) %	90
Model Name	as determined on site
Manufacturer	as determined on site
Controls	CBI
Delayed Start Stat	No
Sap Code	2110
Burner Control	Modulating
Boiler Compensator	None
Flue Type	Balanced
Fan Assisted Flue	No
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators and Underfloor
Underfloor Heating	Yes - Pipes in thin screed
28.0 Secondary Heating	RWM

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Destrciption	Wood Logs Closed room heat
SHS efficiency %	65
SAP Code	633
HETAS Approved System	Yes
Smoke Control Area	Unknown
29.0 Water Heating	HWP
Water use <= 125 litres/person/day	Yes
SAP Code	901
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	80
Cylinder Volume	180
Pipes insulation	Yes
32.0 Thermal Store	None
Thermal Store Pipework	within a single casing
Terrain Type	Urban

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Summary Information

Users Ref: 002-air source heat pump **Issued on:** 21.Feb.2011
EES Ref: 11-602 **Prop Type Ref:**
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2, **DER:** 24.52
TER: 29.75

SAP Rating:	71 C	**CO2 Emissions:**	4.37 t/year	**Fabric Energy:**	82.7	**Energy used:**	142 kWh/m²/year
EI Rating:	75 C	**SAP Energy Cost:**	£ 1034.53	**HLP:**	1.91	**Ene1:** 1	**ZC:** 0.00

Surveyor: admin admin, Tel: unknown
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2011
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Internal Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	46.8	96.8	2.4
1st Storey:	49.2	91.8	3.2

7.0 Living Area	41
8.0 Thermal Mass Parameter	Simple calculation

9.0 External Walls

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
External Wall 1	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.28		70.00	257.40	198.57

10.0 External Roofs

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
sloping roof sections	Plasterboard, insulated slope	0.18		9	93.39	90.79
flat sections of roof	Plasterboard, insulated at ceiling level	0.16		9	13.90	13.90

11.0 HeatLoss Floors

Description	Construction	U-Value	Element	Kappa	Area
Heat Loss Floor 1	Suspended concrete floor, carpeted	0.19		75	96.80

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Opening Type 1	SAP table	Half Glazed Door	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	2.35
Opening Type 2	Manufacturer	Solid Door			No	0	Wood	0.7	1.80
Opening Type 3	SAP table	Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	1.70
Opening Type 4	SAP table	Roof Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	Wood	0.7	2.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width	Height	Count	Area	Curtain Closed
west elev windows	Window - Opening Type 3	External Wall 1	West	None	0	No	0	0	1	29.43	0
west elev rooflights	Roof Window - Opening Type 4	sloping roof sections	West	None	0	No	0	0	1	1.60	0

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north elev windows	Window - Opening Type 3	External Wall 1	North	None	0	No	0	0	1	1.40	0
north elev door	Half Glazed Door - Opening Type 1	External Wall 1	North	None	0	No	0	0	1	1.90	0
south elev windows	Window - Opening Type 3	External Wall 1	South	None	0	No	0	0	1	4.00	0
east elev windows	Window - Opening Type 3	External Wall 1	East	None	0	No	0	0	1	20.00	0
east door	Solid Door - Opening Type 2	External Wall 1	East	None	0	No	0	0	1	2.10	0
rooflights east	Roof Window - Opening Type 4	sloping roof sections	East	None	0	No	0	0	1	1.00	0

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.15
18.0 Pressure Testing	Yes
Designed q50	4.00
Mechanical Ventilation System Present	No
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	8.00

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0	0	1	1
Number of open flues	0	0	0	0
Number of intermittent fans				5
Number of passive vents				0
Number of flueless gas fires				0

21.0 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	SAPTable
Description	air source heat pump
Percentage of Heat	100.00
Main Heating 2	None
Secondary Heating	SAP table
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery System 1	No
Waste Water Heat Recovery System 2	No
Solar Panel	No
25.0 Main Heating 1	
Main Heating	PED
SAP Code	204
Efficiency (SAP Table) %	250
Controls	CHD
Delayed Start Stat	Yes
Sap Code	2207
Boiler Compensator	WeatherCompensator
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators and Underfloor
Underfloor Heating	Yes - Pipes in thin screed
28.0 Secondary Heating	RWM
Destrciption	Wood Logs Closed room heat
SHS efficiency %	65
SAP Code	633
HETAS Approved System	Yes
Smoke Control Area	Unknown

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29.0 Water Heating	HWP
Water use <= 125 litres/person/day	Yes
SAP Code	901
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	80
Cylinder Volume	180
Pipes insulation	Yes
32.0 Thermal Store	None
Thermal Store Pipework	connected by <= 1.5 m pipework
Terrain Type	Urban

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Summary Information

Users Ref: 003-pv panels
Issued on: 21.Feb.2011
EES Ref: 11-602
Prop Type Ref:
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2,
DER: 16.49
TER: 17.55

SAP Rating:	**83 B**	**CO2 Emissions:**	2.92 t/year	**Fabric Energy:**	82.7	**Energy used:**	90 kWh/m²/year
EI Rating:	**83 B**	**SAP Energy Cost:**	£ 622.08	**HLP:**	1.91	**Ene1:** 4	**ZC:** 0.00

Surveyor: admin admin, Tel: unknown
Address:
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2011
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Internal Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	46.8	96.8	2.4
1st Storey:	49.2	91.8	3.2

7.0 Living Area: 41

8.0 Thermal Mass Parameter: Simple calculation

9.0 External Walls

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
External Wall 1	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.28		70.00	257.40	198.57

10.0 External Roofs

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
sloping roof sections	Plasterboard, insulated slope	0.18		9	93.39	90.79
flat sections of roof	Plasterboard, insulated at ceiling level	0.16		9	13.90	13.90

11.0 HeatLoss Floors

Description	Construction	U-Value	Element	Kappa	Area
Heat Loss Floor 1	Suspended concrete floor, carpeted	0.19		75	96.80

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Opening Type 1	SAP table	Half Glazed Door	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	2.35
Opening Type 2	Manufacturer	Solid Door			No	0	Wood	0.7	1.80
Opening Type 3	SAP table	Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	1.70
Opening Type 4	SAP table	Roof Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	Wood	0.7	2.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width	Height	Count	Area	Curtain Closed
west elev windows	Window - Opening Type 3	External Wall 1	West	None	0	No	0	0	1	29.43	0
west elev rooflights	Roof Window - Opening Type 4	sloping roof sections	West	None	0	No	0	0	1	1.60	0

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north elev windows	Window - Opening Type 3	External Wall 1	North	None	0	No	0	0	1	1.40	0
north elev door	Half Glazed Door - Opening Type 1	External Wall 1	North	None	0	No	0	0	1	1.90	0
south elev windows	Window - Opening Type 3	External Wall 1	South	None	0	No	0	0	1	4.00	0
east elev windows	Window - Opening Type 3	External Wall 1	East	None	0	No	0	0	1	20.00	0
east door	Solid Door - Opening Type 2	External Wall 1	East	None	0	No	0	0	1	2.10	0
rooflights east	Roof Window - Opening Type 4	sloping roof sections	East	None	0	No	0	0	1	1.00	0

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.15
18.0 Pressure Testing	Yes
Designed q50	4.00
Mechanical Ventilation System Present	No
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	8.00

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0	0	1	1
Number of open flues	0	0	0	0
Number of intermittent fans				5
Number of passive vents				0
Number of flueless gas fires				0

21.0 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	gas boiler
Percentage of Heat	100.00
Main Heating 2	None
Secondary Heating	SAP table
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery System 1	No
Waste Water Heat Recovery System 2	No
Solar Panel	No
25.0 Main Heating 1	
Main Heating	BGB
SAP Code	102
Efficiency (Sedbuk 2009) %	90
Model Name	as determined on site
Manufacturer	as determined on site
Controls	CBI
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	Modulating
Boiler Compensator	WeatherCompensator
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators and Underfloor
Underfloor Heating	Yes - Pipes in thin screed
28.0 Secondary Heating	RWM

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Destrciption	Wood Logs Closed room heat
SHS efficiency %	65
SAP Code	633
HETAS Approved System	Yes
Smoke Control Area	Unknown
29.0 Water Heating	HWP
Water use <= 125 litres/person/day	Yes
SAP Code	901
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	80
Cylinder Volume	180
Pipes insulation	Yes
32.0 Thermal Store	None
Thermal Store Pipework	connected by <= 1.5 m pipework
33.0 Photovoltaic Unit	One Dwelling

PV Cells kW Peak	Orientation	Elevation	Overshading
1.5	West	45°	None Or Little

Terrain Type	Urban

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Summary Information

Users Ref: 001-solar panels
Issued on: 21.Feb.2011
EES Ref: 11-602
Prop Type Ref:
Property: Land rear of 36, Grove Road, Burbage, Hinckley, Leicestershire, LE10 2,
DER: 17.42
TER: 17.55

SAP Rating:	**81 B**	**CO2 Emissions:**	3.09 t/year	**Fabric Energy:**	82.7	**Energy used:**	96 kWh/m²/year
EI Rating:	**82 B**	**SAP Energy Cost:**	£ 684.82	**HLP:**	1.91	**Ene1:** 0	**ZC:** 0.00

Surveyor: Anglia Energy Cons., Tel: 01366 320168, Fax: (undefined)
Address: 6 St Edmunds Road, Downham Market, Norfolk, PE38 9LP
Client:

Software Version: Elmhurst Energy Systems SAP2009 Calculator (Design System) version 2.03r02
SAP version: SAP 2009, Regs Region: England and Wales (Part L1A 2010), Calculation Type: New Design,

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2011
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Internal Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	46.8	96.8	2.4
1st Storey:	49.2	91.8	3.2

7.0 Living Area	41
8.0 Thermal Mass Parameter	Simple calculation

9.0 External Walls

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
External Wall 1	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.28		70.00	257.40	198.57

10.0 External Roofs

Description	Construction	U-Value	Element	Kappa	Gross Area	Nett Area
sloping roof sections	Plasterboard, insulated slope	0.18		9	93.39	90.79
flat sections of roof	Plasterboard, insulated at ceiling level	0.16		9	13.90	13.90

11.0 HeatLoss Floors

Description	Construction	U-Value	Element	Kappa	Area
Heat Loss Floor 1	Suspended concrete floor, carpeted	0.19		75	96.80

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	Solar Trans	Frame Type	Frame Factor	U value
Opening Type 1	SAP table	Half Glazed Door	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	2.35
Opening Type 2	Manufacturer	Solid Door			No	0	Wood	0.7	1.80
Opening Type 3	SAP table	Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	PVC	0.7	1.70
Opening Type 4	SAP table	Roof Window	Double Low-E Soft 0.05	16 mm	Yes	0.63	Wood	0.7	2.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width	Height	Count	Area	Curtain Closed
west elev windows	Window - Opening Type 3	External Wall 1	West	None	0	No	0	0	1	29.43	0
west elev rooflights	Roof Window - Opening Type 4	sloping roof sections	West	None	0	No	0	0	1	1.60	0

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north elev windows	Window - Opening Type 3	External Wall 1	North	None	0	No	0	0	1	1.40	0
north elev door	Half Glazed Door - Opening Type 1	External Wall 1	North	None	0	No	0	0	1	1.90	0
south elev windows	Window - Opening Type 3	External Wall 1	South	None	0	No	0	0	1	4.00	0
east elev windows	Window - Opening Type 3	External Wall 1	East	None	0	No	0	0	1	20.00	0
east door	Solid Door - Opening Type 2	External Wall 1	East	None	0	No	0	0	1	2.10	0
rooflights east	Roof Window - Opening Type 4	sloping roof sections	East	None	0	No	0	0	1	1.00	0

14.0 Conservatory	None
15.0 Draught Proofing	100
16.0 Draught Lobby	No
17.0 Thermal Bridging	Default
Y-value	0.15
18.0 Pressure Testing	Yes
Designed q50	4.00
Mechanical Ventilation System Present	No
Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	Yes
Air change rate	8.00

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0	0	1	1
Number of open flues	0	0	0	0
Number of intermittent fans				5
Number of passive vents				0
Number of flueless gas fires				0

21.0 Cooling System	No
22.0 Lighting	
Internal	
Total number of light fittings	20
Total number of L.E.L. fittings	20
Percentage of L.E.L. fittings	100.00
External	
External lights fitted	No
23.0 Electricity Tariff	Standard
24.0 Heating Systems	
Main Heating 1	Manufacturer
Description	notional gas boiler
Percentage of Heat	100.00
Main Heating 2	None
Secondary Heating	SAP table
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery System 1	No
Waste Water Heat Recovery System 2	No
Solar Panel	Yes
25.0 Main Heating 1	
Main Heating	BGB
SAP Code	102
Efficiency (Sedbuk 2009) %	91
Model Name	as determined on site
Manufacturer	as determined on site
Controls	CBI
Delayed Start Stat	Yes
Sap Code	2110
Burner Control	Modulating
Boiler Compensator	WeatherCompensator
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators and Underfloor
Underfloor Heating	Yes - Pipes in thin screed
28.0 Secondary Heating	RWM

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Destrciption	Wood Logs Closed room heat
SHS efficiency %	65
SAP Code	633
HETAS Approved System	Yes
Smoke Control Area	Unknown
29.0 Water Heating	HWP
Water use <= 125 litres/person/day	Yes
SAP Code	901
30.0 Hot Water Cylinder	Hot Water Cylinder
Cylinder Stat	Yes
Cylinder In Heated Space	Yes
Independent Time Control	Yes
Insulation Type	Foam
Insulation Thickness	80
Cylinder Volume	200
Pipes insulation	Yes
31.0 Solar Panel	
Solar Panel Area	8
Area Type	Gross
Panel Type	Evacuated tube
n0, a1, A/G ratio	0.6, 3, 0.72
Orientation	West
Elevation	45°
Overshading	None Or Little
Solar Storage Volume	200
Pump electrically powered	Yes
Combined Cylinder	Yes
32.0 Thermal Store	Integrated
Thermal Store Pipework	connected by <= 1.5 m pipework
Terrain Type	Urban

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Anglia Energy Consultants Ltd
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Invoice

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Tax Date	Invoice No
21/02/2011	11-602

Invoice To
Mr & Mrs Cleall Care of AXONBECKETT W5 The Quarters 65 Druids Street Hinckley, Leicestershire LE10 1QG

Ship To
W5 The Quarters 65 Druid Street Hinckley Leicestershire LE10 1QG

Qty	Description	VAT	Amount
	Provide SAP energy calculations and design stage report for submission for Building Regs approval for new dwelling at 36 Grove Road, Burbage. Recalculate at completion and provide EPC (energy performance certificate).	N	155.00
	Provide design stage water efficiency calculations using notional figures to demonstrate compliance with Building Regulations	N	55.00

VAT%	VAT Amount
N@0.0%	£0.00
Total VAT	£0.00

Subtotal	£210.00
VAT Total	£0.00
Total	£210.00

Company VAT Number	

Payment due on reciept - Cheques should be made payable to 'Anglia Energy Consultants Ltd'
Payment by Bank Transfer to: Sort Code: 086081 Account number: 32126012
Please note this invoice is subject to Late Payment of Commercial Debits (interst) Act. Interest charges will be 8% above the base rate on any amount unpaid after 28 days from invoice date