



121 Nash Grove Lane, Wokingham, Berkshire

RENEWABLE ENERGY AND SUSTAINABILITY STATEMENT

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1. Overview

This Renewable Energy and Sustainability Statement (RE&SS) has been prepared in support of a full planning application for a development of one pair of semi-detached dwellings on the above land. The purpose of this RE&SS is to provide a framework to explain the design principles that have been applied to this development.

It is to be read in conjunction with all the relevant supporting documentation included within the planning submission. Details of the site, proposed layout and detail design of the dwellings are contained within the OPUS Design and Access Statement. This statement covers the outline strategy for Renewable Energy and Sustainability only.

Information supporting the energy and sustainability of the new-build design efficiency forms part of the application. Key issues addressed include Water and Drainage management, Renewable Energies, Water Recycling, Mechanical Ventilation and Heat Recovery, and the use of locally sourced labour and sustainable materials.

This statement has been produced on behalf of the applicant.

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2. Site Description

2.1 Finchampstead

The plot is located on the northern edge of Finchampstead in the District of Wokingham, Berkshire .

Finchampstead has a rich history of continual settlement stretching back to the Iron Age. During the medieval period, this area was part of The Royal Forest of Windsor. This was enclosed in the early half of the 19th century and the last remnants of heaths were replaced by plantations. The remaining open farmland was broken up into small units in the second half of the 20th century. There remain a small number of farms in the parish, some with livestock, agriculture, or specialist fruit-growing capability but others given over to paddock land.

The parish is mainly residential, farmland, woodland and nature reserve, giving it a natural or rural character, although there is a light industrial estate in Hogwood Lane. Around the north-western, western, and southern edges of the parish, there are still broad areas of farmland and open space offering recreational opportunities for residents and visitors alike along the parishes' 34kms (21 miles) of footpaths, bridleways, byways and cycle paths.



Site Location : Aerial Photograph (Source: Google Maps 2023)

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To the north lie tree and hedge lined fields and to the east Sand Martins golf course. Further afield lies California Country Park and large areas of woodland and farmland. The Waverley Prep School and Nursery is just to the north-east, at the northern end of Waverley Way.

The surrounding context comprises residential development and open space. There are residential properties to the north, south on both sides of Nash Grove Lane, but none that would be materially affected by the proposal. The existing property is accessed via Nash Grove Lane, which connects to Barkham Ride.

Within the immediate surrounding area there are plots and gardens of differing sizes and building styles.

Immediately to the west, adjoining the rear garden lies Rooks Nest Wood Country Park (RNWC), which contains areas of grassland, woodland and wetland. There is a circular footpath within the RNWC, which in part, runs close to the western boundary of the plot owned by the applicant. Two of the Receptor locations/assessments were located on this foot path.

No 121 NGL comprises a single detached residential dwelling with a front and rear garden, opening on to an area of open grassland with a dense screen of mature trees and planting, along all boundaries. The outbuildings, within the existing garden curtilage, include a detached double garage, a swimming pool with enclosure, a summer house and a shed.

The is a largely flat.

There is no water course, or water features.

3. Energy efficiency and renewable energy

3.1 Energy efficiency and renewable energy

Wokingham Borough Council is committed to tackling climate change and has signed the Nottingham Declaration, which is a public statement of intent to work with the local community and businesses to respond to the challenges of climate change. This includes cutting greenhouse gas emissions such as carbon dioxide and preparing for the changes that climate change will bring.

Information supporting the energy and sustainability of the new-build design efficiency will form part of the application(s). Key issues to be addressed:

- Water and Drainage management
- Renewable Energies
- Water Recycling
- Mechanical Ventilation and Heat Recovery
- Use of locally sourced labour and sustainable materials.

3.2 Water and Drainage Management

Water saving and potential recycling.

In the South of England, water demand exceeds the volume licensed for abstraction, with the shortfall being met from ground water. Twenty per cent of the UK's water is used domestically with over 50 per cent of this used for flushing WC's and washing (source: Environment Agency¹). Most of which comes from drinking quality standard or potable water.

Using fixed fittings, which reduce water use in WC's, taps and showers, can reduce the amount of potable water used within dwellings. The aim is to reduce the consumption of potable water in the home by installing fixtures and fittings that facilitate this. The replacement dwelling will be fitted with dual flush cisterns to all WC's; taps, baths and showers will be fitted with aerating filters and handsets.

Where baths are installed the tap arrangement includes a shower/mixer handset such that it may also be used as a "shower" if wished, using less water.

Water is an increasingly scarce resource, and more and more homes have metered water supplies with householders having to pay for any water they use.

The use of these features will ensure that the new dwellings meet the Government's target, which states that a

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minimum **water efficiency** of 110 litres per person per day should be achieved, as prescribed by the government's 'Housing: Optional Technical Standards.'

The existing dwelling, to be replaced, has none of the above water saving feature.

3.3 Renewable Energies

Renewable energy and energy efficiency

Mitigating and adapting to climate change through sustainable design and construction requires the integration of renewable energy (e.g. roof mounted solar thermal and/or solar PV schemes) and encourages low-carbon heat.

Low and zero carbon heat could include air/ground source heat pumps, biomass boilers and low-carbon gas such as hydrogen and biomethane, ideally combined with renewables.

In this instance, we are proposing a hybrid system with a roof mounted installation of Solar Energy panels combined with a new Energy efficient gas condensing boiler; the market leaders (ie Vaillant ecoTEC with Green iQ and Worcester Bosch Greenstar 8000) are all A-Rated and achieve 94% efficiency.

The system will have the flexibility to provide space heating via an underfloor heating system, wet radiators or a combination of both. It will also for the integration with a Solar panel system which will have zero carbon emissions on site.

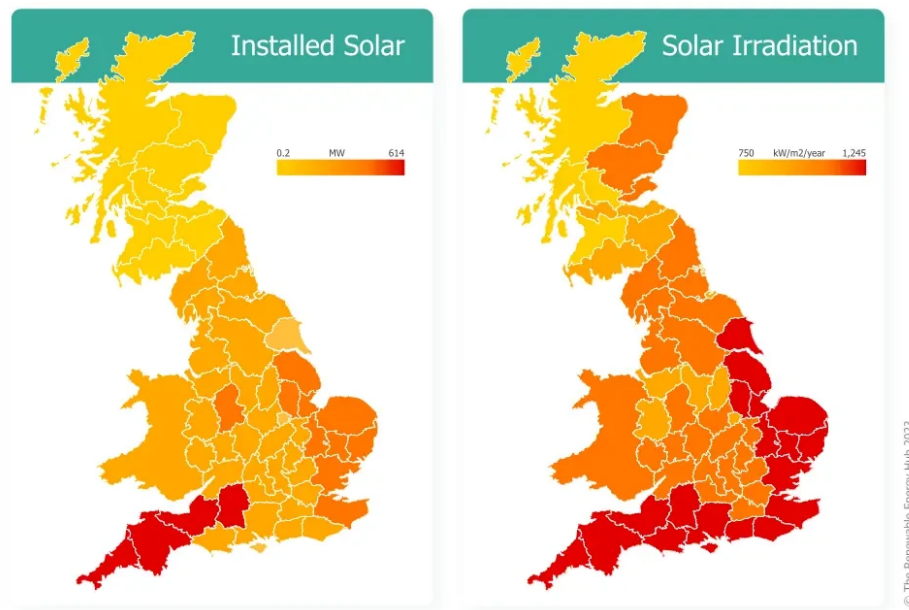
The design allows for a large of area of south facing pitched roof, where PV solar panels, or 'wet' solar panels may be installed to achieve optimum performance.

It is not possible to use a Solar thermal preheat system for larger houses with potential high-water usage, however, by Solar thermal pre-heat, followed by gas water heating it is possible to ensure peak demands are met, with far reduced direct heating required from the gas-fired heater (boiler), conserving energy. reducing emissions and operational costs.

We estimate that the replacement dwelling as designed might accommodate circa 18-20no south facing solar panels, which at 400w/panel, represents an array of 7-8kw, at peak performance.

Factors affecting the optimum performance. Include, shading and obstructions etc., and, of course, the overall amount of sunlight available, which varies through-out the country; however, the location of this plot, within the southeast, sits within an area of medium to high solar irradiation.

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Internal Lighting: low energy, controlled and passive

We welcome the provision of energy efficient internal lighting, thus reducing the CO₂ emissions. The plots will be fitted with light fittings in compliance with the Building Regulations England and Wales, Part L1A², which requires fixed dedicated energy efficient light fittings to be installed throughout.

In addition to the above, Passive Lighting is also to be encouraged. The roof form, with a concealed flat roof, allows for the introduction of a rooflight over the internal hall which allows natural light into the upper and lower halls, reducing the requirement for artificial light, and ultimately reducing energy use and carbon emissions.

3.4 Water Recycling

Surface Water and Rainwater harvesting

Rainwater could be collected to reduce:

- The amount of water being discharged into drains and watercourses.
- The risk of localised flooding.

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- Overall water bills for householders.

The simplest and most cost-effective system for rainwater collection is the water butt; by installing several and recycling rainwater it will be possible to reduce the volume of mains potable water used for external water uses.

We intend collecting the roof water run-off in a below ground tank for use within the domestic garden etc. To create this in the most cost effective and sustainable manner, it is intended to locate the below ground tank, within what is the footprint of the existing swimming pool (which is to be infilled). An overflow from the below ground storage tank will be discharged to a soak -away. Refer to Illustrative Surface Water Drawing for indicative position. The existing dwelling does not recycle and existing rain or surface water run-off.

3.5 Mechanical Ventilation and Heat Recovery (MVHR)

MVHR systems are a year-round, whole-home ventilation solution a proven low-energy and highly efficient ventilation method, typically installed in a utility room. MVHR is fast becoming the most common method of whole home ventilation for new build properties. MVHR systems work by combining supply and extract in one unit. Moisture-laden, stale air is extracted from 'wet' areas, such as kitchens and bathrooms. The heat from this stale air is recovered via a heat exchanger, and this tempered air delivered into the living areas of the home.

Some MVHR ranges will recover heat with up to 95% efficiency. In addition, MVHR systems provide continuous trickle ventilation to ensure a consistently level of fresh filtered air into the property to maintain adequate indoor air quality.

However, to install a MVHR system the 'structure' of the building needs to allow for the necessary duct runs, and to achieve this effectively, it requires the use of a floor construction with has integral void space. The floor construction that we are proposing for these dwellings, namely Posi-Joists, provides such a void.

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Open webbed metal/timber joist system

Posi-Joists combine the lightness of timber with the strength of the Posi-Strut steel web allowing you to span far greater distances, eradicate the need to cut holes to install cabling, pipes and other services that may be required. As well as the large load bearing surface means the joists can not only be installed quickly but flooring can also be fitted more accurately in a shorter time frame, resulting in minimising costs and timings during construction.

Note, a typical supply and extract duct will be a have a minimum diameter of 100mm. It would not be possible to pass these through standard timber joists. The use of these joists in the proposed dwellings will allow the fitting of a MVHR system should that be deemed necessary, from the outset, or retrospectively.

4. Sustainable Construction and Design

Climate Change

The Climate Change Act 2008 (amended 2019) set a legally binding greenhouse gas emission reduction target of 100% by 2050, compared to 1990 levels. The Committee on Climate Change's report Reducing UK emissions Progress Report to Parliament, June 2020, describes the transition to net-zero emissions as needing all energy to be delivered to consumers in zero-carbon forms (ie electricity, hydrogen, hot water in heat networks) and come from low-carbon sources (ie renewables and nuclear, plus bioenergy and any fossil fuels being combined with Carbon Capture and Storage) (32) For buildings, which make up 18% of 2019 emissions(33) , the Committee describe the 2020s as a period of 'efficiency, heat networks [and] heat pumps (new build, off-gas, hybrids)' and the 2030s and 2040s as a period of 'widespread electrification, expand heat networks, gas grids potentially switch to hydrogen'.

4.1 Construction

The overriding principle here is that buildings should be designed with a **fabric first** approach in mind – as making buildings energy efficient and low-carbon from the outset makes them cheaper to run and more comfortable to use. Starting from this base, reduces the need to provide renewables and carbon offsetting. As far as is practical, we have adopted this approach.

Embedded Carbon

Choosing materials that have low carbon emissions in their sourcing, manufacture and distribution as well reducing the quantity of materials to be used, simplifying form and building efficiently will have a significant impact on the embodied carbon of a project. The NBS website notes that 55% of the global industrial carbon emissions come from the manufacture and processing of five key materials, including steel (25%) and cement (19%). We have sought to reduce the use of materials with the highest embodied carbon, be replacing Reinforced Concrete floors slab with beam and block floors and by replacing internal concrete blockwork walls with timber frame etc.,

1. Concrete
2. Steel
3. Timber
4. Brickwork
5. Insulation

Operational Carbon

On top of energy efficiency and a fabric first approach, it is also important to move to a zero carbon through the reduction of **operational carbon**. To this end the timber frame, low concrete, maintenance free product, form of construction supports this goal, by reducing construction deliveries to site, have a shorter build program and have reduced on-going maintenance costs, with the associated benefit.

Buildings should also be designed to facilitate waste minimization; beam and block floors and timber framed homes both reduce waste, due to site specific off-site design, construction and procurement where waste can be reduced, managed and effectively recycled where appropriate.

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Local labour and Suppliers

We are also committed to using local labour and suppliers where possible to reduce the operational carbon footing associated with the construction process and to ensure that where possible, the construction and products sales will remain within the local economy, benefiting local businesses.

4.1 Design Considerations

It is important to acknowledge that to adapt to climate change we need to adhere to and develop sustainable design principles and sustainability standards.

Sustainability principles, which are essential to the mitigation and adaptation of climate change, can be summarized using the following hierarchy:

1. the choice of **location** of development (for example, are schemes accessible to public transport and not in areas at risk of flooding?)
2. the **linkages** the development makes to its neighbors (for public transport, active travel means and wildlife corridors)
3. the **layout** of schemes (for example, are schemes walkable, cyclable and safe for all generations and abilities of users?)
4. the **land-uses** (for example, do schemes enable people to live near to where they work, and will it be possible for uses to easily adapt over time as work and home life patterns change?)
5. **landscaping** (do schemes provide, for instance, street trees and green space to prevent overheating and ensure urban shading and cooling, sustainable drainage and a contribution to green and blue infrastructure networks which all provide for biodiversity net gain and contribute to climate change adaptation)
6. the **design and construction of buildings** themselves (for example, are buildings pleasant for the long term, do they allow passive lighting, ventilation and cooling (which can be as simple as openable windows and external blinds) and will they be healthy and comfortable places to live and work in, are they energy and carbon efficient, made from sustainable materials, and designed to make sustainable living easy?) .

We believe that the proposed designs meet or positively address all of the above criteria.

Amenity Space

Local Plans usually determine minimum levels of provision that developments should attain in respect of acceptable levels amenity space, privacy and overshadowing for neighbours and future users etc.,

Policy TB07 of the Managing Development Deliver Local Plan and Principle R17 of the Borough Design Guide require adequate internal space to ensure the layout and size achieves good internal amenity. Principle R16 of the Borough

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Design Guide requires that rear gardens are at least 11 meters deep and 1 metre set back from the boundary to allow access thereto. All the proposed 'separation' distances comfortably exceed the WBC's minimum requirements, as does the amenity space provided.

Overlooking

R15 of the WBC Borough Design Guide SPD requires the retention of reasonable levels of visual privacy to habitable rooms, with a minimum separation distance of 22 meters to the rear and 10 meters to the street for a two-storey dwelling. The replacement dwelling already sits within a large plot some distance from Nash Grove Lane and with a high degree of separation between the existing properties, and with mature landscaped boundaries.

The windows on the front elevation would be situated at a sufficient distance from neighboring properties as to mitigate against any harmful overlooking or loss of privacy. Indeed, the separation distance to 117 NGL, which is a two and 1.5 storey dwelling, is increased. Notwithstanding that, we do acknowledge that the replacement dwelling has some two-storey elements, and there will now be two windows on the front elevation, (which serve Bedrooms), which face the rear of 117 NGL.

However, the separation distance between the dwellings at this point is circa 69 meters, with a well planted, mature site boundary; this will be enough to sufficiently mitigate any overlooking concerns. Indeed, the current property is 44m from No 117, so the separation distance is being increased by circa 50%.

Loss of Light and Overbearing

R18 of the Borough Design Guide SPD requires sufficient sunlight and daylight to new properties, with dwellings afforded a reasonable outlook, preferably dual aspect and no material impact on levels of daylight in the habitable rooms of adjoining properties. R16 of the Borough Design Guide SPD requires separation distances of 1 meter to the side boundary and 11 meters to the rear boundary. In terms of overbearing and loss of light impacts, the proposed dwelling would be suitably located away from the adjacent neighboring properties not to pose any unreasonable concerns to any neighboring properties.

New Dwellings to comply with Building Regulations Part M-Accessible and Adaptable Home

All new dwellings are required by Policy DM11 to meet the Building Regulations Requirement M4(2) Category 2, Accessible and Adaptable Dwellings.

The replacement dwelling has been designed to in a bedroom and ensuite located on the ground floor, off the proposed Lounge. There are no internal steps or ramps required to access this area and all clear door opening/widths to this area will be set out to be in accordance with the relevant Part M requirements. Hence, the dwelling has been 'future-proofed' should there ever be the need for accommodation at ground floor.

Vehicular and Pedestrian Access

Car and cycle parking will be provided in accordance with Policy CC07 and Appendix 2 of the MDD Local Plan stipulates minimum off street parking standards, P3 of the Borough Design Guide SPD notes that parking spaces are to be a minimum of 5m x 2.5m and the proposal is in accordance with this guidance.

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- The scheme has proposed a total of 5 allocated parking spaces with hardstanding for visitors; Each space will be a minimum of 5m x 2.5.
- In addition there is sufficient space for cycle secure cycle storage within the integral garage.
- Provision for an EV charging point is located within the integral garage.

The main road network is capable of accommodating and carrying traffic generated by the site and the design of the site does not compromise road safety to other road users.

Home Office/Study

The number of self-employed people is increasing, as is the number of people who work from home. Many job functions can readily be performed remotely, so it is quite feasible for individuals to work from home (or elsewhere) on either a full or part time basis. Currently there are more than 1.1 million people in the UK who have such non-traditional work patterns. Information from social trends indicates that 29 per cent and 24 per cent of employed men and women respectively have, at some time, worked from home. The benefits of working from home include reductions in transport movements, increased time available for the home worker and greater opportunities to participate within community activities. Working from home for many people requires a telephone line as well as a connection to the Internet for data transference and even video conferencing. Dedicated service ducts to each property will be located adjacent to the Family Room to allow for the installation of fibre optic technology should it be available within the village.

There are several rooms, and areas within the dwelling which may be used as study areas, we have included a dedicated study of the primary living area, adjacent to the Kitchen. At present, Mrs Lewis often works from home, with the subsequent Energy and Carbon footprint savings associated with not having to commute daily.

Drying Space

It has become increasingly common practice to include a place for a tumble dryer without necessarily attempting to design in a space for natural drying. It follows that by providing an area or facility for drying clothes naturally, we can reduce/negate the energy required for the drying clothes. As such an area of hard standing and a clothesline will be located within the rear garden, which can be used to dry clothes in the open air. Refer to illustrative Landscaping layout.

Refuse Collection and Recycling

Refuse collection and recycling is an important aspect of sustainability often overlooked. Without provision for sorting and storage locally recyclable materials may be contaminated. Wokingham Borough Council provide for a range of recycle bins and cartons; a dedicated area will be provided within the garden with a Bin Collection Points locate close to the Highway, ensuring that the development conforms to the requirements set out in the \Manual for Streets (2007) recommends at paragraph 6.8.9 that “*residents should not be required to carry waste*

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more than 30m to the storage point” and “waste collection vehicles should be able to get to within 25m of the storage point.” In this regard, the proposal accords with the recommendations as set out within MfS.

Enhanced biodiversity creation (BNG)

It is incumbent upon all development proposals to demonstrate an environmental net gain for biodiversity, Biodiversity Net Gain (BNG), and seek to support and enhance habitat creation and urban greening.

However, certain building processes, maybe exempt providing that they meet certain criteria, or fall below several specified thresholds. In this instance, the project is a self-build project and falls within the criteria as defined in section 1(A!) of the Self-build and Custom Housebuilding Act 2015. ie the development must be:

- of no more than 9 dwellings- the development is a 1-4-1 replacement dwelling
- be on a site that has an area no larger than 0.5 hectares; the site is 0.28 hectares.
- consist exclusively of dwellings that are self-build or custom homebuilding as defined by the above Act.- the dwelling is both custom design and a self-build dwelling.

5. Summary

In summary:

- The siting, massing and design of the dwellings are entirely consistent with the sustainable design principle described within this document.
- The renewable energy principles described, will result in a low energy, low/zero carbon design.
- The method of construction and choice of material will lead to a low-carbon solution with reduced waste and efficient recycling.
- The house design will allow for a flexible lifestyle, which may be adapted if/as family structures alter, and includes a work from home facility, with the consequential benefits.