

HAMPSTEAD GARDEN SUBURB TRUST

Notes towards a policy document on

Renewable Energy and Energy Conservation

DRAFT

The Trust is sympathetic to the desire of residents to contribute to the responsible use of energy. It is something we should all attempt to do. There are many ways in which we can adapt our homes, and our behaviour, to make a major difference without impacting adversely on the special architectural environment of the Suburb.

Technologies change constantly and there are a bewildering number of products on the market which make claims to being green. The Trust is only able to give very general advice to residents on the possibilities of adopting energy-saving measures and harnessing solar or renewable energy. There are numerous possible approaches which should be carefully researched to establish the best solution for individual requirements.

A number of websites are listed below which provide information on the subject. For a good introduction visit www.energysavingtrust.org.uk and <http://www.dti.gov.uk/energy/sources/renewables/index.html>

However, from the Trust's perspective, there are some serious considerations that must be taken into account, the most important being the potentially damaging impact that power-generating technologies may have on the appearance of the Suburb. Of particular concern are roof-mounted solar panels and wind turbines, many of which are of questionable efficiency and value. Suburb houses were built when there was little thought of energy saving technology. At the time, the primary environmental concerns within the planning agenda focused on creating a beautiful place to live. Today, the preservation of the Suburb's character could be actively hindered by the use of some forms of alternative technology unless this is carefully managed.

The Suburb is protected as an outstandingly successful area of townscape. It must not be damaged by inappropriate installations. However, there is still a great deal that concerned residents can do to adapt their own houses to a modern and responsible energy ethic without altering the important appearance and character of the buildings.

The actual construction of any mechanism for energy generation both uses a large amount of energy, and releases carbon and toxins into the environment. This has prompted suggestions that people could have greater personal impact by simply changing how they use and conserve energy in the home, rather than embarking on costly innovations to generate more power.

RENEWABLE ENERGY SUPPLIERS

The best source of renewable household electricity is a reputable supplier who provides power to your house like a standard company, but can ensure that it comes from a sustainable or renewable origin. Companies such as Ecotricity, nPower Juice and Good Energy can supply efficiently produced, green energy to your house, covering 100% of your requirements, unlike domestic solar panels or turbines which only supply a fraction and take decades to recover their costs.

Switching energy suppliers is easy. The following list contains suppliers who sell renewably-produced power to the general public at prices that are just as affordable as, or sometimes cheaper than, coal/fuel-powered energy.

www.npower.com/greenelectricity

www.ecotricity.co.uk

www.greenenergyuk.com

www.good-energy.co.uk

London Energy, Powergen and Scottish & Southern Energy all offer renewable tariffs.

See www.greenelectricity.org for comparables and what's on offer.

However, a few residents may wish to produce some of their own energy. If so, there are a number of technologies available and one of them may be appropriate for your requirements. Here are some notes to help you decide.

DOMESTIC SOLAR ENERGY

Solar energy can be harnessed through different kinds of cells and either used to heat water (solar thermal) or to create electricity (solar photovoltaic). Though relatively uncommon in the UK, it is growing in popularity and reduces reliance on conventionally-produced electricity. However, cells can take a long time to pay for themselves and concerns have been raised over the initial production costs.

Visit www.npower.com/solar for information on self-generation and buy-back schemes. Solar thermal is relatively inexpensive to install.

1. About four square metres of solar panels on a roof is required to provide the average family with about 40-60% of their hot water needs throughout the year. If these can be concealed on a discreet flat roof or within the crown of a roof, it may be possible for the Trust to approve such an installation. Solar panels or tubes cannot normally be mounted onto a sloping tiled roof where they will be visible, as this would have an unacceptable impact on the appearance of the property.
2. Externally, the following has to be taken into consideration; the location of the panels when assessing the amount of sunshine during the day, pipe runs, tank siting, roof pitch and access for maintenance.
3. Potential users will have to find out whether the solar panel (or tubes) can be flat mounted or not. For maximum efficiency, panels are usually mounted at 30° to 45° to the horizontal on a south-facing roof (up to 65° will still work in the UK) and away from the shadows of buildings, trees or chimneys.

4. You will need easy, safe access to the panels as they require regular checking and periodic cleaning.

Solar energy can also be used to generate electric power using solar photovoltaic panels (large versions of the cells used in calculators) meaning that more than just hot water can be sustainably created in the home. Equipment rated at 6KW is needed for a 4-bedroom house to be self-sufficient in electricity. Unfortunately, the cost of installation is very high (over £30,000) and most houses can only fit enough to generate 2KW on their roofs because of the inefficiency of existing technology. This is unlikely to become a popular solution in the Suburb, because roof space is further limited by the need to preserve the appearance of the houses.

WIND POWER

Interest is also growing in rooftop wind turbines; two are undergoing trials in the UK so it is difficult to advise on this source at the moment. Small-scale operations may provide an efficient, renewable and clean source of power in some areas. The Trust is not as yet able to provide detailed information on this subject, but the same problem arises with turbines as with solar panels, in that they would represent a substantial impairment of the appearance of Suburb houses and views. Concerns have also been raised that fixing wind turbines to houses could cause structural damage due to resonance. Noise can also be a problem. Furthermore, small turbines work best in an exposed, windy spot with no interference, therefore placing these within domestic gardens in a built up area may not be the most efficient method of generating clean power.

SOIL HEAT PUMPS

Soil heat pumps can provide for all home and hot water needs and are acceptable from a visual point of view, as they are buried, usually under a lawn or terrace. Heat is collected from below the ground, where it maintains a constant temperature throughout all seasons and transferred into the home through a network of liquids, rather like a refrigerator working in reverse. Because you are moving already-existent heat 24 hours a day, rather than creating it by burning oil or gas, the system is efficient, with average savings of 50-70% on annual running costs. Soil heat pump efficiency is maintained, in contrast to conventional boilers which dramatically reduce over time.

For every 1 unit of electricity used an average of 4 units of heat are produced meaning 75% of your energy use comes from your own power plant under your garden, the other 25% comes from the electricity used to drive the heat pump. When coupled with a renewable electricity supply (e.g. Juice from npower) heating, hot water and electricity demands are catered for with zero CO₂ emissions, thus helping reduce home greenhouse gas production. Soil heat pumps are relatively expensive to install, but can be a useful contributor to renewable energy production without damaging the appearance of the area.

At a depth of 1m, the temperature in the ground is fairly constant between 7 ° and 13°C throughout the year. The soil heat pump uses a ground loop (pipe) with a water and glycol mixture to capture some of this energy. There are three types of heat collection from the soil –

Straight ground loop:

Ideally the loop consists of a single straight out and return line. However it often consists of several loops brought together with a manifold.

Slinky ground loop:

Substantially reduces the space required by coiling the ground loop back on itself.

Compact collector ground loop:

The patented collector allows a ground loop to be used where space is at a premium. The collectors can be buried flat to reduce the depth of the earthworks or vertically, to reduce the area needed for the panels.

www.ecoheatpumps.co.uk

www.iceenergy.co.uk

www.heatpumps.co.uk

www.clear-skies.org gives lists of installers.

BIOMASS HEATING

During the winter, most people rely on gas/electric central heating systems which consume large amounts of energy and release it inefficiently. Suburb residents are permitted to use open fires in their homes provided smokeless fuel is burnt - this can augment the use of central heating during the winter months, but isn't very eco-friendly as it perpetuates use of coal and wood. Changing to a biomass burner provides an efficient and visually discreet way to heat a house; it uses natural organic fuel that has absorbed carbon dioxide in its original state of plant matter, and is thus 'carbon neutral' as this cancels out the CO₂ it creates when it is burned. The best biomass burners are up to 90% efficient and some have boilers attached so that the water heating is dealt with sustainably too. However, biomass fuel is not usually counted among the authorized fuels to be burnt in smoke-free zones such as the Suburb, so the individual appliance must be checked. Visit www.uksmokecontrolareas.co.uk for a list of approved appliances, and see www.alternative-energy.co.uk for guidance on suppliers.

www.boilers.org.uk

www.clear-skies.org

www.britishbiogen.co.uk

Biomass can also be used to power boilers with stoves attached for renewably powered cooking.

It is believed that biomass will be able to play an important role in the future of renewable power, and grants may be available for installation. See www.est.org.uk

HOME IMPROVEMENTS AND LIFESTYLE CHANGES

The Trust is keen to encourage residents to adopt forms of renewable energy generation that would not spoil the appearance of the Suburb, but is also keen to ensure that energy use and waste is minimised. Many residents may find that simple, daily changes to their lifestyle make as much difference, and at a lower cost, as installing an expensive system. There are numerous energy-saving measures:

1. Insulate your roof as efficiently as possible, using sustainable sheep's wool insulation if possible. Suburb roofs often constitute a large percentage of the total building envelope.
2. Insulate existing external walls from the inside. This will have a big impact on heat loss. This is often possible when major works of renovation and alteration are being carried out. (Owners of listed buildings must check with Barnet as consent may be required.)
3. If you are extending your house, make sure that roofs, floors and walls are highly insulated. The movement of heat means that thick walls keep heat out of the house in the summer, and retain it inside during the winter.
4. Consider secondary glazing as this has little detrimental impact on the appearance of the building.
5. In some cases, carefully designed double glazing can be approved which will not change the appearance of the building. The Trust has worked with a number of joinery firms to develop double-glazed windows to match the originals. On NO account will uPVC windows be approved. They are unsustainable and environmentally damaging products and are in all cases incompatible with the visual character of Suburb houses. For further information on approved joiners, please contact the Trust. Residents may wish to consider traditional shutters on the inside of their windows to reduce heat loss once the room is warm.
6. Use energy-saving light bulbs. Light bulbs may seem small but they can make a considerable difference. An ordinary bulb wastes 95% of its energy on heat. This means it is only 5% efficient. Bulbs take up an average of 25% of a household's energy. A standard energy-saving light bulb lasts for up to 12 times longer than a normal bulb, uses 1/4 of the electricity a normal bulb would use and thus can save approximately £9 per year as well as 38g of CO₂. Exclusive use of energy-saving bulbs throughout the UK could save the equivalent of the outputs of two power stations a year; Suburb residents could make considerable savings at a personal and national level.
7. Remember to switch off appliances, lights and standby buttons.

The vast majority of the house renovation and extension carried out in the Suburb is performed without a thought to energy use or building performance (other than a desire for double glazing). The overuse of high-energy downlighters, multiple plasma screen TVs, unnecessary electrical appliances and, worst of all, air-conditioning, is at the core of the problem and will not be solved by fixing a solar panel to your roof which will not offset the energy consumed by these.

Think carefully about whether you really *need* to renew a kitchen or extend your property – it's only another building envelope to heat and service.

ELECTRIC CARS

London has seen recent growth in numbers of short range battery electric vehicles (EVs). They can be practically 'zero emission' if recharged using renewable electricity supplies, though emissions are generated during car production. Even using standard grid electricity, they are cleaner than traditional internal combustion engine vehicles due to efficient energy use and lack of exhaust fumes. Smaller commuter EVs have ranges of 30-60miles (50-100km), while some higher performance examples have ranges of 150miles (240km).

While the purchase cost is often high compared to conventional cars, large savings can be made in operating costs, free or reduced rate parking offers, Vehicle Excise Duty exemption, and London Congestion Charge discount. The cars are mechanically simple, thus servicing costs are also reduced. However, an EVs battery is expensive and after a while will need replacing as capacity will start to reduce.

Electric vehicles can be recharged by plugging into a conventional electrical socket, though this takes many hours. Special home charging systems can be installed within garages or on the side of homes, tapping into the household mains and providing safer, faster transfer to cars through an inductive panel. Technology for much faster recharging is being developed. Some London councils (such as Westminster) are installing free electric recharging points in car parks and on-street locations.

Residents with usable garages or off-street parking would be able to maintain EVs without impacting on the character of the Suburb as all that is required is an electric connection to the household supply. However, recharging would be problematic for residents without an off-road parking space and creating one is not always possible if the appearance of the Suburb is to be protected.

Hybrid electric cars

Hybrid vehicles are powered by a combination of petrol or diesel and electricity, thus reducing emissions. Though hybrid cars cost more than conventional to purchase, fuel costs will be around two thirds of an equivalent petrol fuelled vehicle. As most use regenerative braking, where energy is put back into the battery when braking, all they require is filling with fuel at normal petrol stations. Other models need charging like EVs, and run exclusively on the battery until a speed (e.g. 31mph) or distance (70mile) threshold is crossed. Performance is comparable with a conventional vehicle, if not better (some models have much faster acceleration). Due to use of petrol Hybrid cars do not have the distance related problems of EVs. Other benefits include discounts from the London Congestion Charge and reduced Vehicle Excise Duty.

Hybrid cars whose batteries are recharged during driving would not impact on the Suburb any more than usual vehicles as no special infrastructure is required. This would be an attractive alternative for those residents without off-road parking provision.

Alternative forms of fuel

Much research is currently being invested in alternative forms of fuel, such as Liquefied Petroleum Gas (LPG), Biodiesel, Bioethanol and Biogas. There are London based refueling stations mainly catering for LPG. However, the technology is not yet widespread.

GETTING THE BALANCE RIGHT

The Trust is keen to accommodate the pressing concerns of climate change. However, new technologies for harnessing renewable energy are not free of environmental damage of their own. Ethical considerations are rarely straightforward and every attempt to do the right thing comes at a price. Bear in mind the following; although the operation of solar cells is totally pollution-free, their manufacture has some environmental costs. Substantial mining and chemical processing is necessary and some of the materials used, such as arsenic and gallium, are extremely toxic.

And remember, our behaviour is as important in our attempts to address climate change as harnessing alternative technologies. Driving your children halfway across town to school in a large-engined car is a lot more damaging than putting them on the bus to the local school. A long-haul flight to an exotic holiday destination is a greater contribution to global warming than a week caravanning in Rhyl. There is little point in announcing your green intentions to the world with a solar panel on your roof if you have three large-engined cars parked outside and a heated pool in the basement.

IS PERMISSION NEEDED?

As with any alteration to the external appearance of a Suburb property, do get in touch with the Trust's Architectural Advisers in the first instance. Some installations may be carried out without Trust consent but for most an application will be necessary. It is likely that planning permission will also be required from the London Borough of Barnet.

CARBON OFFSET PROJECT CONTRIBUTIONS

These provide an alternative way for residents who are unable to make a particular impact on their own carbon use to offset this by paying into a company that helps sustain carbon-neutral development across the globe. Some of these trade in carbon credits, others assist in the building of low-energy structures and the propagation of the low-energy ethic, and a variety of tailored packages are available, for example offsetting the carbon produced by your car, by frequent flights, or by family holiday travel.

Visit websites of companies who specialize in investing in carbon-neutral development programmes, and consider this option as a way of making an affordable and appreciable difference within the visual parameters set by the Trust. However, this should not be seen as the alternative to making lifestyle changes and adapting our homes to use less energy.

www.carbon-clear.com
www.carbonneutral.com
www.carbonoffsets.org
www.carbonfund.org

This paper has been produced to encourage debate on ways in which residents can adopt sustainable approaches to the adaptation of Suburb properties without damaging the special character of the area. Please let us have your views and ideas.

Write to the Hampstead Garden Suburb Trust, 862 Finchley Road, London NW11 6AB or email planning@hgstrust.org.

