Executive Summary

The aim of this study was to examine the potential for renewable energy production and use within the County of Surrey. The study was to focus on bioenergy since this is clearly seen as being the priority area for action in the short term. However, other renewable energy opportunities were also to be examined. In addition, the study was to pick up on technical and non-technical barriers to realising significant uptake of renewables, so enabling the County to make 'its fair share' contribution to regional and national renewable energy targets.

The report commences with a discussion of existing and future planning guidance and policy statements from national through to local levels that influence the development of renewable energy. Of particular importance is the Structure Plan SE2 which requires all new residential and commercial developments (over a certain size) in Surrey to be designed to provide 10% of their energy requirements from renewable sources. This requirement is anticipated to considerably increase renewable energy generation in Surrey if it is rigorously enforced. The policy will encourage new developments to consider a range of renewables and in particular woodfuel, by necessity increasing the awareness of renewables amongst developers.

A brief review of all the technical options available to Surrey is provided along with case studies of existing renewable energy technologies within the county. Opportunities for grant assistance are also referenced. It is important to note that according to the South East Regional Planning Guidance – Energy Efficiency and Renewable Energy (Harnessing the Elements) the primary renewable energy resource for the sub region of the Thames Valley and Surrey is biomass. The 2010 target for this sub region being 140MWe installed capacity of which almost 50% is estimated to come from biomass. Particular focus was given to the direct combustion of biomass rather than advanced technologies such as gasification and pyrolysis which are still in development. Direct combustion of biomass can be used to generate heat, electricity or a combination of both known as combined heat and power (CHP). Cooling can also be generated by 'absorption cooling' methods and such a procedure when coupled to CHP is known as 'Trigeneration'.

Grant opportunities that have been highlighted in the report focus on two areas, the first being general purpose grants whereby renewable energy schemes may be eligible and secondly specific grants focusing on renewable energy projects. Worthy of special note are the following schemes:

- Clear Skies – this scheme has two funding rounds left with deadlines of 1st July 2005 and 4th November 2005, the scheme will close on the 31st March 2006. Consultation for a replacement scheme will continue through the Summer of 2005 and indications are that any replacement might commence in April 2006 although the start date is not guaranteed.

- Carbon Trust Action Energy Loans – these loans are available to SME's to bridge the funding gap that exists for businesses wishing to increase their use of renewable energies. The loans are available for 4 years and range from £5k - £100k, they are unsecured and interest free.
- Powergen Greenplan – these grants are available for any renewable energy technology but must demonstrate wider community benefit. Grants range from £5k to £25k.

The barriers to the development of new renewable energy schemes are discussed in general and subsequently focussed on the barriers applicable to Surrey. The key factors that present barriers to the development of bioenergy within Surrey are;

1. The relatively high capital cost of schemes and financing
2. The lack of a fuel supply infrastructure
3. A lack of developer acceptance and understanding.

The upfront capital cost of wood fuelled boilers is higher than that of conventional oil or gas fired boilers. Add to this the cost of a fuel hopper for example and in some cases a new boiler house and the bill increases significantly. Grant schemes can make useful contributions restoring financial parity, however, they are mostly limited to community groups or the public sector. Whilst this is welcomed it does tend to alienate the important private sector SME that could derive considerable benefit from developing renewable energy schemes in the county. SMEs are closest to the renewables industry and, finances to one side, are the most likely target group to take up the technology.

In common with virtually every other part of the UK, Surrey lacks a mature wood fuel supply infrastructure. Such a situation is a real barrier to the development of local wood fuelled schemes. Surrey is subject to the 'chicken and egg' conundrum that is so often quoted within the biomass industry of "No market as no supply and no supply as no market". However, this is a barrier that is gradually being removed as an infrastructure is put in place using intermediate markets such as Slough Heat and Power. This is helping to achieve a breakthrough whilst the end markets are developed in Surrey. ***The Council is encouraged to assist with maintaining development of the infrastructure through influence, funding and direct involvement.***

Finally, despite a significant increase in knowledge of biomass systems over the last five years, there is still a knowledge gap existing and a distinct lack of understanding of the long term opportunities amongst developers of renewable energy schemes. This too is being tackled by companies such as TV Energy through activities such as planning and bioenergy workshops and by the Forestry Commission through their ongoing activities on woodfuel promotion. ***Again, the Council is encouraged to assist with activities geared to targeting developers.***

The report then assesses the woodfuel resource within Surrey and looks at the existing forestry resource and summarises the data for Surrey that was published by the Forestry Commission as part of their Woodfuel Resource project in 2004. In addition, small scale

woodland work, residues generated from sawmills, arboricultural material, short rotation coppice and clean material from civic amenity sites was also considered. Material from civic amenity sites has been ruled out as a useful resource at this stage as too much contamination appears in this stream due to poor signposting at civic amenity sites and often a lack of space that enables the clean separated wood to be contaminated with trade waste and other contaminated woods. Particular care must also be taken when considering material from sawmills and fencing companies that the residues have not been contaminated by processes such as tanalising.

Key resources for Surrey are the existing woodland resource which according to the Forestry Commission can yield the following quantities of woodfuel until 2021:

Period	Quantity (ODT)
2004-2006	91,952.4
2007-2011	95,724.8
2012-2016	93,713.8
2017-2021	80,819.3

Due to the cost of extracting this material and processing to produce a high quality woodchip it is deemed to be most suitable for small scale local heating projects that can pay a higher price for the fuel due to the high specification required and the direct competition with oil and gas as alternative heating fuels. Woodfuel generated through small scale woodland activities such as clearance work conducted by volunteers is also most suited to the small scale local markets. This is mainly due to the small quantities of material generated and the costs of extraction.

Arboricultural residues generated across the eight counties of the south east of England are deemed by the Forestry Commission to be in the region of 105,000 oven dry tonnes when all the collected arisings are taken into account. This remaining quantity of wood residues is potentially available for use in bioenergy facilities such as the developing small scale market and existing plants such as Slough Heat and Power. An instant opportunity for Surrey is to increase the use of some of this biomass resource through Slough Heat and Power although there are issues that must be taken into account:

- All woodchip must be stored on hard standing,
- The chip must be free from contamination e.g. stones, mud, grit, paint, chemicals,
- Chip containing high proportions of green matter must be allowed to stand for 4 – 6 weeks,
- The chip must be no greater than 50mm in any dimension.

If all the above criteria are met then there is potential for the chip to be sold on to Slough Heat and Power for energy production.

A particular opportunity that shows great potential to supply in this way is the development at Norbury Park Sawmill. This sawmill currently produces large quantities of slabwood and off cuts from on site processing but can only utilise a small proportion of this wood in two boilers on site. The potential to establish the Sawmill (or a local site)

as a 'tree station' was identified as a key opportunity. Hence, the Sawmill was selected as one of the three feasibility studies to be conducted as part of this overall study. The outcome of the feasibility study was that Norbury Park itself is likely to be too restrictive as a tree station in the longer term due to the small area of land available on site and access limitations. The recommended solution is instead to utilise a nearby site, such as a farm with the necessary existing infrastructure in place (hard standing, good access and covered areas). This site could then draw on further material generated through the Surrey Wildlife Trust's land management activities, also frrom locally generated tree surgery material so increasing the throughput of the site. The aim would be for the site to focus on supply to Slough Heat and Power initially and to then divert increasing quantities of fuel to supply small scale biomass installations as they come on stream.

In addition to the existing woodfuel resource, there is also a potential for short rotation coppice within Surrey. The existing woodfuel resource available from the woodland within the county will only enable approximately 50% of Surrey's renewable energy generation target to be met from woodfuel. In order to meet this target and to go beyond the 2010 targets the county will need to look towards dedicated energy crops to supplement this supply.

There are a number of potential, economic end market opportunities available now for the considerable biomass resource that exists in Surrey. The first of these uses wood fuel in small scale heating systems in existing or new buildings that would otherwise use oil or electricity as the main heating fuel. The key reason for this niche opportunity is that biomass is already very competitive with oil and electricity. (Note that it is not yet sufficiently competitive with natural gas to allow economic replacement although prices of fossil fuels are rising rapidly and this situation may change over the next year.) The most suitable buildings for using wood fuel will have a reasonable heat demand over a prolonged season such as is found in nurseries, leisure centres or hospitals. Modern wood heating systems usually make use of a buffer tank to enable the system to match the head load most effectively and this allows them to perform across a wider variety of end users including schools, business parks, offices and flats. Essentially the potential end users for biomass heating are considerable, however, practical restrictions such as financing and access for fuel storage/ deliveries on site can often be the limiting factors.

In addition to the small scale heating systems there is opportunity within Surrey to utilise biomass/ wood fuel to its fullest extent by means of combined heat and power (CHP) or trigeneration installations. Developments such as town centre regeneration projects, mixed housing and commercial developments along with other large scale developments offer great opportunity for wood fuel. ***SCC is encouraged to maintain a watching brief through TV Energy of the adjacent Bracknell 'RENAISSANCE' scheme where trigeneration techniques are to be demonstrated with European Commission endorsement and grant funding.***

From the several opportunities that have been highlighted through the course of the study, the two that were selected for outline feasibility study were the new council offices at Runnymede and the Surrey Hills Business Park in Wotton, near Dorking. Both schemes

have much technical potential, although the Runnymede Council offices scheme would give a poor financial payback due to the switch from gas-fired heating. However, there remains much enthusiasm from the Council for making the change.

Surrey Hills Business Park is a much more expensive scheme due to the need to install a district heating main around the site to make the most of the resource. Nevertheless, the proposed wood fuelled scheme could be cost effective since it would replace oil and electricity as the main heating fuels. Heat would then be supplied, as now, through individual heat supply contracts.

Finally, the report recommends future steps for Surrey County Council and its partners to take in order to move forward with woodfuel heating and renewables more generally. ***The Norbury Park Tree Station concept is highlighted as a prime, practical opportunity for the County to lead the way in the south east and assist with getting the necessary supply infrastructure in place.*** Certainly, close working with property services to identify potential projects well in advance and early identification of new developments that could have the potential to be CHP schemes is a key activity that could generate dividends for Surrey County Council so enabling it to actively increase the use of renewables within the county.

The report also suggests that a 'hearts and minds' campaign with schools might reap considerable benefits. A low cost competition might raise the profile of the County Council's work on renewables and also sow the seeds for a series of small scale wind, wood and solar projects. This could be championed through the 'Community Renewables Initiative' and hope to draw in regional and national funding bodies.

All-in-all, the report paints a picture of considerable potential in the County for renewables and a will from those interviewed in both the public and private sector to make change happen. If the several initiatives noted here are pursued then there is every expectation that the County can become one of the leading advocates for sustainable energy and connected sustainable development.