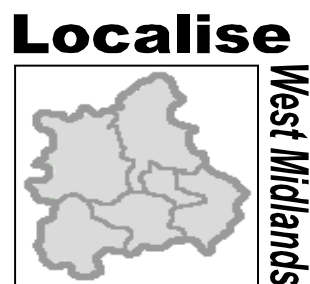


Preparing for a Feasibility Study for Decentralised Energy in Birmingham

**Report prepared for Localise West Midlands in partnership
with the Birmingham Sustainable Energy Partnership**

February 2007



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The Greenpeace logo, consisting of the word "GREENPEACE" in a bold, green, sans-serif font with a slightly irregular, hand-drawn appearance.

**Greenpeace Environmental
Trust**

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*Sections 1-6 and Annexes were prepared by Hestia for Localise West Midlands.
The Foreword and Section 7 were prepared by Localise West Midlands*

1 Foreword

Localise West Midlands is a not-for-profit thinktank, consultancy and campaign group set up to promote the environmental, social and economic benefits of:

- Local trading, using local businesses, materials and supply chains
- Linking local needs to local resources
- Development of community and local capacity
- Decentralisation of appropriate democratic and economic power
- Provision of services tailored to meet local needs.

This localisation approach makes economic development and government systems more sensitive to local autonomy, culture, wellbeing and the responsible use of finite resources, and is growing in popularity with people and organisations all over the world.

Localisation helps build social capital, targets regeneration to meet local needs, maximises local job creation, and reduces transport and CO2 emissions.

As part of this approach LWM supports the greater use of decentralised energy, particularly because it is a sector in which the benefits of localisation can so clearly be seen. In addition, decentralised energy is one of few approaches to the UK's energy situation that has the potential to remove the perceived need for new nuclear generation. We were inspired by the recent promotional materials from Greenpeace on decentralised energy, and subsequently by the thorough scoping studies conducted in London and Edinburgh.

As the largest local authority in Europe, with a relatively high population density, LWM saw a good opportunity to carry out the same approach in Birmingham. Given that Birmingham is not a capital city as Edinburgh and London are, the replicability of achievements in this city has greater significance for other areas of the country. Additionally, the timing was right for Birmingham considering the carbon neutrality goal of the City-region, and the significant support and interest from the city council's Urban Design department, who are responsible for the two CHP projects planned for areas of the city centre and for concurrent research on biomass.

In addition we were keen to see issues of community ownership addressed in our scoping report on the grounds that local control and local multiplier effect are two positive extra contributions that can be gained from decentralised energy systems if the right approach is taken.

We are grateful to Hestia Services Ltd and to Birmingham Sustainable Energy Partnership for their work towards this scoping exercise, as well as to our funders, Greenpeace Environmental Trust. As climate change, energy security and communities' rights and responsibilities become ever more urgent issues, we look forward to taking forward a full feasibility study and to the adoption of more efficient, community-owned decentralised energy systems in Birmingham in the next few years.

*Karen Leach
Localise West Midlands, February 2007*

Endorsements

The Birmingham Coventry and Black Country City Region is exploring a range of policy interventions that will support our commitment to move towards carbon neutrality. The work undertaken by Hestia for the Birmingham Sustainable Energy Partnership will help to inform the work which the city region is committed and welcomes the study.

*Sandy Taylor
Strategic Regional Advisor
Regional, European & International Division
Birmingham City Council*

This report clearly demonstrates the potential for developing strong, decentralised energy generation in Birmingham, and the benefits that this would bring the city, in terms of security, economy and sustainability. A feasibility study such as that described by this report would be a valuable first step in building such a decentralised energy economy in Birmingham, and BCC Sustainability and Energy Management group is strongly supportive of this initiative and will be keen to discuss our potential involvement as the project progresses.

*Sustainability and Energy Management Team
Birmingham City Council*

2 Summary

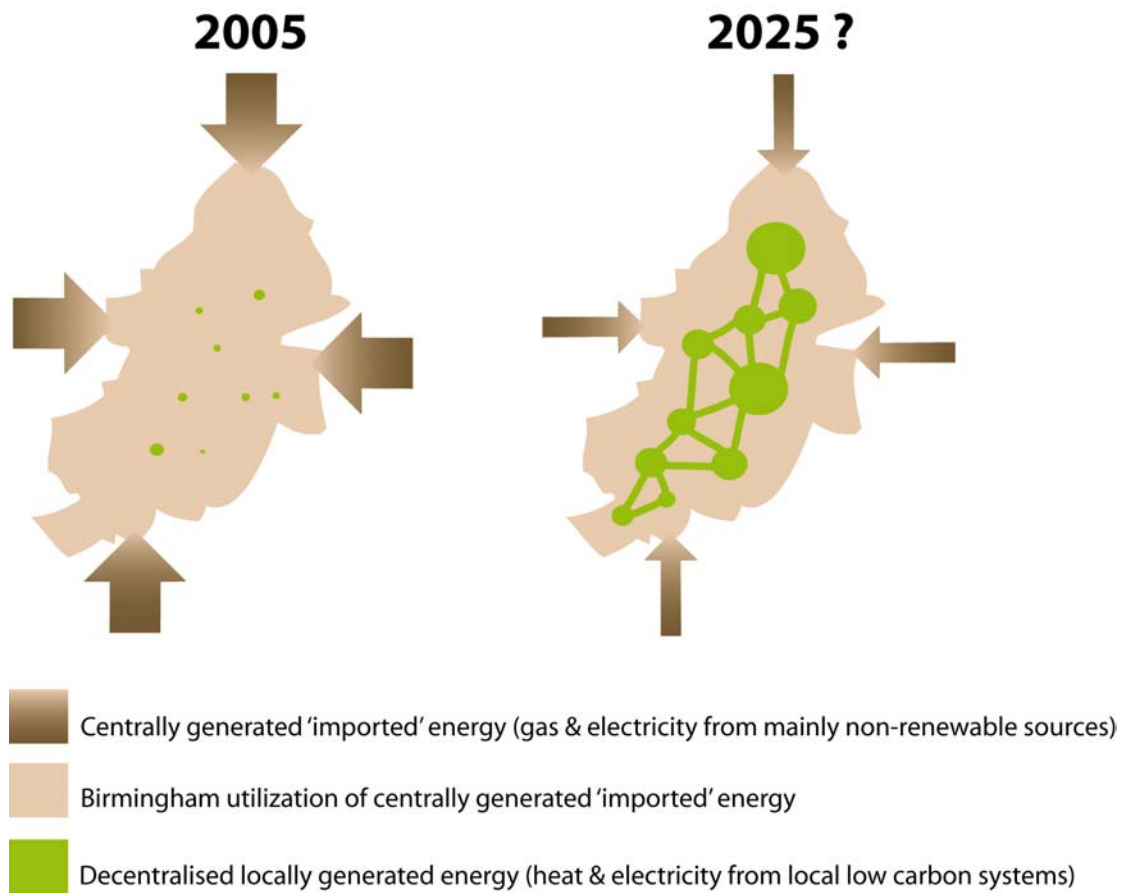
- 2.1 The report highlights the benefits of conducting a study into the potential for Decentralised Energy (DE) in Birmingham, including the availability and cost effectiveness of accessing necessary information and data.
- 2.2 Methodology is considered and it is concluded that the approach developed in reports on DE in London and Edinburgh would provide a valuable platform, rather than a template for a report in Birmingham.
- 2.3 The report argues that a two part report considering a range of DE supply scenarios in the first part and contextualising this with consideration of the macro economic environment in the second part would provide the most valuable benchmark for future strategy and policy discussion
- 2.4 The report finds in favour of community ownership models to get maximum social and educational benefits from DE, and sets out some further areas for research in a future feasibility study.
- 2.5 Terms of Reference that could be used to invite tenders for suitably qualified consultants to carry out the proposed study have been included as Annex 1. These Terms of Reference are consistent with the proposed methodology.
- 2.6 Additional Annexes cover potential sources of data for the proposed study, a list of strategic links and contacts including regional stakeholders and those with whom we have discussed the proposed study.

3 What is Decentralised Energy?

- 3.1 Decentralised energy is defined as energy generated and preferably owned close to the point of use. The scope for this study is therefore the production of heat and/or electricity within Birmingham and for Birmingham's use, from low carbon sources using the range of technologies detailed below. A schematic diagram has been prepared (figure 1) to graphically illustrate the switch to DE.
- 3.2 The range of technologies that are available to achieve this objective includes combined heat and power plant (CHP), solar (photovoltaics (PV) to provide electricity and thermal to provide hot water), micro-wind (including rooftop mounted turbines), micro-hydro, heat pumps and biomass.
- 3.3 The overarching objective of a DE strategy would be to see a significant proportion of the energy consumed in homes, municipal buildings, factories, offices and shops being generated from decentralised energy, and for an overall reduction in that energy consumption, by 2025¹.
- 3.4 Socio economic consideration relating primarily to the costs associated with electricity distribution systems (known as 'use of system charges') has led the Thamesway ESCO scheme in Woking to establish 'private wire' networks for municipal and other buildings in the town in order to avoid these charges.
- 3.5 A significant proportion of Birmingham's energy demand in buildings is for heat. A community heating (CH) network would provide the most efficient means of meeting the demand. Essentially CH comprises a network of highly insulated pipes for the transmission of hot water from sites where it can be heated (for example CHP or waste to energy plant) to other sites around the city where it is needed (for example municipal buildings, factories, shops and houses).
- 3.6 The establishment of private heat and electricity networks for reasons connected with thermodynamic efficiency and cost efficiency is likely to be a key component of DE to be considered by consultants undertaking a feasibility study.

¹ A baseline of 2005 and projections to 2025 are consistent with the model used for a study in London and we see no good reason not to adopt this approach. Most of the existing generation of nuclear power stations, with the exception of Sizewell B, will have been retired by 2025.

Figure 1 Schematic illustration of the Birmingham 'switch' to Decentralised Energy



4 Why conduct a feasibility study for Birmingham?

Background

- 4.1 Decentralised generation of energy has been widely recognised as having the potential to contribute significantly to the reduction of overall energy usage, reduction of carbon emissions and provision of secure sources of energy. In order to understand the options and quantify the opportunities in Birmingham, a detailed study will be required and the objective of this scoping study was to explore the viability and key requirements for a full study, including:
 - The availability of information and data
 - The options for analysis and modelling available to undertake a detailed 'opportunities and appraisal' study into the potential for decentralised energy in Birmingham
 - An assessment of the effort and likely costs required for each of the options identified for a detailed 'opportunities and appraisal' study
- 4.2 Hestia was commissioned to carry out this study by Localise West Midlands, in partnership with the Birmingham Sustainable Energy Partnership. The work has been funded by Greenpeace Environmental Trust.
- 4.3 Climate change is not an issue that can be addressed at the municipal level. However, a City with Birmingham's resources can play a highly significant and leading role in shaping strategy and policy. Birmingham could be the first non-capital city to carry out a full feasibility study into the potential for decentralised energy in the UK.
- 4.4 The Birmingham City-region has set itself a target to move towards carbon neutrality by 2040. The proposal also comes at time when Birmingham as a council and City is placing significant importance and resource at energy efficiency and climate change adaptation projects across the City. Activities include the forthcoming launch of a public consultation on a Birmingham Climate Change Strategy, the setting up of a dedicated Energy Services company to manage two large scale combined heat and power plants, a City wide domestic renewable energy programme installing microgeneration technologies in fuel poor homes and the proposed development of a Climate Change Agency to coordinate all climate change activities.
- 4.5 Centralised power stations waste two thirds of the energy resource they consume, with the waste arising either as heat or in transmission losses as the electricity is transmitted over large distances. This results in massive avoidable CO₂ emissions. In contrast, DE systems reuse the heat that is produced (in CHP plants) and significantly cut transmission losses as the power is used nearby. The replacement of gas and electricity used in the home with for example solar energy, results in zero CO₂ emissions.
- 4.6 Decentralising energy supply is not a short term ambition. It will require large scale coordination of priorities, programmes of activity, stakeholders, and a step change in the energy use and behaviour of residents, businesses and

public sector agencies. It will also require the council and its West Midlands neighbours to commit to a coordinated effort across geographical and administrative boundaries.

Benefits summary

"Power devolved is energy released" David Miliband, July 2006

There are a number of powerful arguments for undertaking a feasibility study:

- 4.6 Decentralised energy is likely to be the only sustainable way to meet challenging Government CO₂ emission reduction targets of 60% by 2050.
 - 4.7 Security of energy supply will result from locally generated DE. Imported energy, particularly non renewable primary energy sources that are imported from outside of the UK are likely to carry higher supply risks as stocks reduce and global demand increases. Economic benefits accrue when risk is reduced. Flexibility and choice in meeting demand will also result in economic benefits over time.
 - 4.8 The national grid may benefit from reduced load, although locally, increased demand may be placed on the infrastructure.
 - 4.9 Significant economies of scale are possible with the manufacture of DE technologies particularly domestic scale equipment for example solar water heating.
 - 4.10 There is a significant opportunity for local manufacture of DE equipment providing jobs and creating skills. This opportunity would increase the local multiplier potential from a market currently mainly served by major companies outside Birmingham. The city is already considering the future skills required to meet the demands of a growing renewable energy market and developing partnerships with key business leaders in order to promote environmental awareness in schools.
 - 4.11 Proven and reliable DE technologies should be considered as part of the study, however in light of the role of Birmingham as a Science City and the launch of a regional centre for hydrogen fuel cell technology, less developed technologies may be included for the city's long term aspirations.
 - 4.12 Assumptions made in respect of the performance of DE technologies should remain conservative. The result will be a realistic assessment of the possible impact of the widespread adoption of the technologies in Birmingham.
- 3.11 Significant developments in prioritising climate change mitigation and adaptation, cross-boundary policies, and environmental research and development (particularly biofuels, biomass and fuel cell technology) are taking place within Birmingham and the West Midlands Government Office region. It will be of significant value to bring together these elements in considering the viable options for decentralising Birmingham's energy supply.

Links with other strategies

- 4.13 Decentralised energy will have a significant impact on a wide range of national to local strategies and policies – key examples from each level of Government or geographical area is provided below. All recognise the role that decentralising energy supply will have in meeting climate change mitigation targets and adapting to climate change.

A more comprehensive synopsis of relevant strategies is provided in Annex 4.

4.14 UK – The Economics of Climate Change

The global market for renewable energy technologies increased by 25% in 2005 alone². The Stern Review states that “growth rates in [renewable energy] markets will continue to be strong...” and this will create business and employment opportunities.

4.15 National - The Energy Challenge

Published by the DTI in July 2006, the Government’s energy review recognises the role that decentralizing energy distribution networks will play in reducing emissions, increasing diversity and also the security of energy supply. The Energy Review states that Government will look at the potential contribution of distributed energy as a long-term alternative or supplement to the current highly centralised system.

4.16 Regional – West Midlands Regional Energy Strategy

The West Midlands Energy Strategy, published in November 2004, sets out the region’s commitment to ensuring a sustainable, secure and affordable supply of energy for all, and also its commitment to delivering the climate change challenge. Its headline objectives include increasing the use of renewable energy, with targets to generate 0.3 percent of consumption from renewable sources by 2010 and 1 per cent by 2020.

4.17 Sub regional - Core Cities and the Birmingham City-region

The Core Cities group was formed in recognition of the shared agendas of the eight major cities representing England’s largest City-regions. A city-region is a cluster of areas which are mutually interdependent economically and socially, and have complementary roles within the cluster.

The Birmingham city-region has set itself a target to move towards carbon neutrality by 2040. In a report to the West Midlands Metropolitan District Leaders and Chief Executives³, it was identified that of the four broad ways of working towards this target, one would be to replace carbon intensive energy sources with low carbon ones.

Cross-boundary agreements and working practice will be essential, for example joint policies on planning, ensuring links between decentralized energy projects and the use of existing or development of new infrastructure, and the creation of joint supply chains for alternative fuels.

² Stern Review: The Economics of Climate Change, October 2006 p270

³Towards a carbon neutral city-region, November 2006

4.18 Local - Birmingham Climate Change Strategy

The Birmingham Strategic Partnership (BSP) will launch its Climate Change Strategy for Birmingham in 2007. The strategy's two main aims are to identify actions that will deliver the City's target of reducing carbon dioxide emissions by 20% from 1990 levels by 2010, and 60% by 2050, and measures that will enable Birmingham to adapt to a changing climate.

A draft strategy and action plan is soon to be launched for public consultation. Actions have been identified under seven key themes including Planning and Land Use and Buildings. Existing proposals include reducing the City's reliance on fossil fuels through the setting of on site generation targets for new developments.

5 Sources of information

- 5.1 The report has assessed the information required to carry out a full feasibility study into decentralised energy in Birmingham.
- 5.2 The Edinburgh and London studies used both data derived from national sources, such as Census 2001, and local authority figures in calculating their baseline positions and future projections. Data sourced for these two reports included population, economic growth, heat demand, and existing and new domestic and non-domestic buildings.
- 5.3 Consultation with Birmingham City Council's Urban Design team raised the importance of population and its impact on the demand for energy, particularly in the domestic sector. For example, a significant increase in the number of households occupied by older residents could lead to an increase in the demand for daytime heating.
- 5.4 Key sources of information for a Birmingham study therefore may include the following. A detailed list of data and sources is provided in Annex 2.

Census 2001

- Population and population demographics
- Household and occupancy data
- Employment data by sector
- Physical environment e.g. land use, commercial & industrial floor space

DTI Energy Trends

- Energy consumption and carbon dioxide emissions

Building Research Establishment

- The UK potential for community heating with combined heat and power (methodology for mapping heat demand estimates by postcode and identifies effective community heating and CHP sites by postcode area)

Birmingham City Council

- Economic trends and forecasts on growth rates, employment and investment
- Development Summary (observed development and trends in 2005-06, land for future development etc)
- Population projections to 2028

- 5.5 Existing heat demand data will also be a key resource for projecting the potential role for DE across the City. Useful methodologies and sources of information include the Buildings Research Establishment community heating report⁴ and also studies by London and Edinburgh⁵.
- 5.6 All sources of information identified above and contained in Annex 2 are available to download, or may be requested in hard copy directly from the publishing organisation. Further accessibility details are provided in Annex 2.
- 5.7 Whilst important to a full feasibility study and the analysis of possible scenarios to 2025, we would suggest that the data *already* available (albeit in some cases reported on different years or to be extrapolated from national data) is sufficient for a 2005 baseline to be established. This is consistent with the approach used in both the London and Edinburgh studies.

⁴ The UK Potential for community heating with combined heat and power. See Annex 2 for details.

⁵ Powering London into the 21st Century, GLA; Community Heating development study for London, GLA; Powering Edinburgh into the 21st Century, City of Edinburgh Council.

6 Scope of the feasibility study

Outline of the approach

- 6.1 The basic model adopted by PB Power in the DE study for London⁶ would be appropriate for Birmingham. Whilst we are proposing some variation to the fundamentally technically focused approach adopted in this report, there will be value in using a broadly similar methodology, as the reasoning is sound and comparisons would be valuable.
- 6.2 In addition to the consideration of the technical feasibility, we propose that the broader macro environment is also considered. Political, economic, social and legislative developments will shape the future for DE and for this reason we propose that technical scenarios are presented in one part of the report, with the broader environmental factors considered and in a second part in order to place the technical conclusions into perspective.
- 6.3 By 2025 it is highly probable that, with a high DE adoption scenario, Birmingham could be on track to meet the government's target of a 60% reduction in emissions by 2050. However, without a contextual treatment of the political and socio-economic environment that would be required to achieve such a technically feasible outcome, the value of the report would be questionable.

Methodology options

- 6.4 A proposed variation from the methodology adopted for the London study is the inclusion of energy supply requirements to meet a cooling demand. Firstly, demand for cooling is likely to increase over forthcoming coming years as Birmingham experiences higher summer temperatures, and secondly, CHP systems can be made more cost effective by coupling them to double-effect heat pumps, allowing the system to effectively reverse its process in summer, extracting heat from the building. This type of system is known as tri-generation.'
- 6.5 The range of supply scenarios below that we recommend are considered in the proposed report are also included in Annex 1 as part of the Consultants Terms of Reference. These are:
 - A. Low nuclear
 - B. High nuclear
 - C. Low DE – low nuclear
 - D. High DE – low nuclear
 - E. Low DE – high nuclear
 - F. High DE – high nuclear

⁶ Powering London into the 21st Century, Mayor of London/Greenpeace, March 2006

- 6.6 Scenarios E and F were not considered in the London study. The study projected that in 2025 some 2% of national grid electricity would be nuclear and 62% combined cycle gas plant. It was argued that the marginal plant to be replaced by DE was gas rather than coal fired, and to do otherwise would have resulted in overstated CO₂ emission savings. The CO₂ emissions factors associated with nuclear (like renewables) is assumed to be zero.
- 6.7 In scenarios E & F, the marginal plant to be replaced by DE would also be gas as the same 'marginal plant' argument holds even though in this scenario we are considering a gas/coal/nuclear national grid supply
- 6.8 If the study determines that scenario F is viable from an energy balance standpoint then it is also the case that this would probably result in the highest percentage reduction in CO₂ emissions.
- 6.9 We propose that options E and F are included, not because we are in favour of nuclear power, but simply because if shortly after the report is published the government announces a new nuclear programme, the report would include the relevant supply scenario for high DE. This would not be the case if scenarios E & F were omitted.
- 6.10 A report without options E and F would certainly be likely to demonstrate that the Government's key CO₂ emission targets could be met without nuclear power – however it may fail to effectively present the case for DE investment in the event that new nuclear stations are given a political stamp of approval.
- 6.11 A recently published report for Edinburgh⁷ uses similar methodology to that of the London study. In light of the rapidly changing political landscape and divisions on the nuclear issue combined with our view that a study for Birmingham should consider the macro environmental issues, we suggest that previous studies should be used as a platform rather than a template for a report in Birmingham. This view is reflected in the drafting of a possible terms of reference in Annex 1.

⁷ Powering Edinburgh into the 21st Century, City of Edinburgh, WWF Scotland, Greenpeace, November 2006

7 Conclusions

- 7.1 The report concludes that Birmingham can play a highly significant and leading role in shaping strategy and policy in the area of decentralised energy generation. Furthermore, DE is likely to be the only way to meet challenging Government CO₂ emission reduction targets of 60% by 2050.

Availability of data

- 7.2 Data and other useful sources of information are readily available and will be cost effective to access and utilise in the proposed study. Existing heat demand data will be a key resource for projecting the potential role for DE. Useful methodologies have already been developed and are referenced in section 4 and Annex 2.

Suggested scope

- 7.3 The basic model developed by PB Power in the DE studies for London and Edinburgh and funded by Greenpeace Environmental Trust will be appropriate for Birmingham, however a number of variations are also suggested.
- 7.4 In addition to the consideration of the technical feasibility, we propose that the broader macro environment is considered in recognition of the political, economic, social and legislative developments that will shape the future for DE.
- 7.5 We also suggest that energy supply requirements for cooling are also considered recognising the potential change in energy supply needs as temperatures increase during summer months, and the inclusion of two additional future scenarios – low DE and high nuclear, and high DE and high nuclear. The latter would ensure the feasibility study is relevant should the Government announce the approval of even a limited new nuclear build programme.

Benefits of a full feasibility study

- 7.6 It is concluded that a range of benefits will accrue from the completion of a DE feasibility study for the city:
- (i) a benchmark energy demand estimate will be established for 2005 and a projection modelled for 2025. These will be essential for measurement of progress against DE targets in future years.
 - (ii) centralised power stations waste two thirds of the energy resource they consume – the report will robustly demonstrate how this ‘thermodynamic madness’ can be avoided in Birmingham in the future.
 - (iii) the range of DE supply scenarios that have been proposed in the report, coupled with suggested socio economic analysis and review, will help educate and inform residents as to how Birmingham can lead the way in this critical policy area.
 - (iv) in terms of policy integration, it can be concluded from the consideration of the considerable number of related policy initiatives

and projects taking place across the City, that a DE study is a 'missing piece of the jigsaw'.

- 7.7 Benefits are also likely to arise due to the following:
- (ii) flexibility and choice in meeting demand
 - (iii) security of energy supply
 - (iv) the national grid may benefit from reduced load
 - (v) significant opportunity for local manufacture of DE equipment providing jobs and creating skills.
 - (vi) economies of scale are possible with the manufacture of DE technologies

Strategic or financial support

- 7.8 There are a number of significant programmes of work taking place across the City and wider West Midlands region that could support, and in turn benefit from, a full DE feasibility study being carried out. A number of individuals currently working on those initiatives have been consulted during the preparation of this report and useful information has been woven into the document where appropriate (refer to Annex 3 for further details).

Programmes include:

- The Birmingham city-region which has a target to move towards carbon neutrality by 2040
- Birmingham Science City, with an aspiration for Birmingham to use its expertise in environmental technologies to become a low carbon City
- Birmingham Climate Change Strategy, recently launched energy services company (ESCO) and proposed Climate Change Agency
- Various activities by the Urban Design and Energy Management teams at Birmingham City Council, including the potential use of bioenergy across the City

Further details of these programmes and other activities taking place across the City and wider West Midlands region are contained within the proposed consultant's terms of reference in Annex 1.

- 7.9 Announced in the Government's Local Government White Paper⁸, the Department for Environment, Food and Rural Affairs is committed to exploring "the best way of encouraging the establishment of ESCOs with the core cities". Whilst Birmingham has recently launched a City-wide ESCO, additional strategic and or financial support may be available to Birmingham as part of recently announced research to meet this commitment.
- 7.10 The Birmingham Environment Partnership, a key group within the Birmingham Strategic Partnership, may also be able to offer funding support for a feasibility study, due to the potential role of DE to meeting CO2 reduction targets and therefore the Partnership's meeting Local Area Agreement targets.

⁸ Strong and Prosperous Communities – the Local Government White Paper, DCLG, October 2006.

7. Models of Ownership for Decentralised Energy

Sam Hunter, Localise West Midlands

Introduction to Community Ownership Models

As discussed elsewhere in this scoping study, decentralised energy (DE) is an approach to energy production normally considered desirable as a means of helping combat CO2 production and increasing efficiency and energy security. As it focuses on the installation of small, localised generators deriving their power from either renewable or otherwise wasted sources, and as these are normally fitted in homes and businesses, there is an obvious secondary benefit that it can be a means of providing the public with a new way of approaching and viewing energy production and consumption. This then leads to efficiencies driven by behaviour as well as by technology. DE can also assist communities economically by increasing the local multiplier effect and socially by building greater community involvement, responsibility and control over its own affairs.

The degree to which DE can deliver these benefits depends in part on how this emerging area is developed and controlled. These new technologies require some adaptation of conventional technologies and practices, and ascertaining the best structure of ownership is integral to ensuring smooth interaction with existing systems and maximising the potential benefits of DE.

There are three main models for the ownership of DE. These are laid out in a paper produced by the Universities of Sussex, Southampton and Imperial College London, titled *Unlocking the Powerhouse: Policy and System Change for Domestic Micro-generation in the UK*, and are detailed below:

- 'Plug and Play'. Plug and play refers to DE or micro generation systems bought and run privately. The plug and play model of ownership is one which is beginning to develop, with some major DIY retailers now stocking solar PV and other products.
- Utility company controlled. Company controlled schemes have a traditional energy company buying and installing micro generators in private houses or other sites, which act as a host (possibly in return for reduced bills). These schemes are normally controlled through remote metering.
- Community micro grids or Community Energy Companies (CECs). These involve DE sited in communities, often residences, and owned by community shareholders.

The merits and difficulties faced by these different approaches will be considered below. In particular, the way in which the different models relate to issues of metering will be examined. This is because metering is vital to the effective running of DE schemes, and is heavily tied in to issues of ownership and the legislative environment in which DE is developed.

Private Ownership ('Plug and Play')

- The main barrier to a wider uptake of this model of ownership is financial - the cost and associated risk of installing a DE system is met by private individuals. This can be mitigated by selling back excess electricity to the grid, particularly if supported by ROCs (renewable obligation certificates).
- Up to 10 million meters in the UK may lack a backstop function. This can result in situations where the meter runs backwards, so that readings can be misleading⁹. This partly stems from poor regulation, with no requirement for individuals installing micro generators to inform their electricity supplier. Further examples of regulatory difficulties can be found in the confusion over the necessity for planning permission for micro-generation projects (with local authorities taking different views on this), and the rules governing distribution network operators (who derive income based on the amount of electricity running through their system, and therefore have a disincentive to aiding micro-generation schemes).
- A vague legislative framework can harm the financial viability of private ownership of DE. Ofgem, the industry regulator, says '(we) frequently receive reports of micro generators who cannot find a purchaser for excess electricity'. The government is currently considering legislation that would make it compulsory for utility companies to purchase energy generated in this way, with a minimum guaranteed price.
- For private individuals to make best use of DE, a change in metering is normally necessary. This is because of the aforementioned problem of back-running, and because improvements in metering can allow proper measurement of exported energy, as well as time-of-day pricing displays which help people make rational decisions about their energy usage.
- One of the benefits of any system that incorporates time-of-day pricing is the potentially revolutionary effect it has on supplier/consumer relations. Becoming a partial supplier can have the effect of changing people's use of energy, as they are better able to see its cost and derive financial reward from minimising their consumption.
- One of the main problems with the plug-and-play approach, besides the cost, is the high burden of responsibility it places on the individual, in terms of requiring a considerable amount of attention to function properly. Plug-and-Play devices are rarely sold with support for purchasers in terms of the appropriateness of technology for the property and energy usage; or in terms of whether that individual could reduce their demand as a better solution in the energy hierarchy to making such a purchase. It may therefore only be taken up by those with a decent understanding of the issues involved, and with sufficient resources to afford this option, or alternatively may lead to undeservedly low reputations for technologies that are ill-applied.

⁹ R. Sauter, J. Watson, L. Hughes (2004), Metering, Communication and Control Technologies for Micro-Generation, Science and Technology Policy Research Unit (SPRU), University of Sussex.

Company Controlled

With this approach, all of the costs of installation and maintenance are met by the energy company, making it easier to finance than privately run schemes.

- The simplicity of this approach, and its compatibility with existing structures or ownership and control, is its main strength. Remote meters normally have to be installed, but these costs are met by the company, and there is no fundamental change in the relation between supplier and consumer.
- The minimal and passive role played by the host has positives and negatives. It is easy, requiring no major changes in the behaviour of consumers, and not necessitating a better understanding of energy markets or energy supply and consumption.
- The passivity of hosts in a company-controlled scheme is also a missed opportunity. DE has the potential to change energy users from passive consumers to producer/consumers. This gives people an incentive to understand energy production in a way missed in the company-controlled model. While production is controlled by companies, there is also no economic incentive for them to encourage energy efficiency, which effectively reduces their market.
- Less local money circulation: the local community invests in the company in terms of the bills it pays, but this money leaves the community straight away, in comparison with the greater local multiplier effect of community ownership (see below)

Community Ownership

- There are several forms community ownership can take - ownership through a community energy company, by becoming stakeholders in a commercial development, or through joint venture projects between public and private partners.
- Of these, community energy companies achieve the highest range of social benefits. They provide the clearest incentives for people to actively engage in energy production, as those participating will be investors in the company. They also provide a high level of control, and ensure any economic rewards are retained within the community.
- The potential for DE to reinvigorate local economies can be particularly important in rural areas, where employment opportunities are otherwise scarce. The construction and servicing of DE systems can play a vital role in maintaining the viability of a community. In the UK, many rural areas benefit from excellent potential for wind power, and any resistance to wind technologies can be mitigated. The work of the Highland and Islands community energy company in developing wind generators on common grazing land is a good example of the positive effects this structure of ownership can have in otherwise marginally viable rural communities
- One of the main challenges of this approach is in developing the metering systems necessary to allow stakeholders engage with energy markets. Triple

metering systems are often necessary, to allow measurement of imported, exported and generated power. The costs associated with the processing of this data are not inconsiderable.

- High metering costs explain why it is normally essential to monitor generated electricity - in order to qualify for Renewable Obligation Certificates (ROCs), without which many such schemes are not economically viable. This can exclude certain biomass generators and CHP (combined heat and power).

Other models of community ownership may solve some issues of metering or financial viability, but at the expense of the direct involvement of the community. Issues related to complex or advanced metering, involving time-of-day pricing and other innovations, should not necessarily be viewed as a major obstacle to a community ownership model. A number of other European countries, including Sweden and Italy, are in the process of installing advanced or remote metering, and many future innovations in energy technology may utilise them. The Unlocking the Powerhouse study¹⁰ says 'smart meters should not be viewed as an optional extra that some consumers might want to buy, but as an essential element in a reoriented energy market based on services rather than supply'.

Within Birmingham, the benefits of community owned energy companies are already being explored by the East Birmingham Energy Company. The company was registered in 2005, and operates in some of the most disadvantaged wards in the city, including Nechells and Sparkbrook. Its role in stimulating the local economy was recognised when it attracted funding from the Regional Centre of Excellence, Advantage West Midlands, under the East Birmingham North Solihull Regeneration Zone. Initially focused on energy efficiency and sustainable housing, the EBCEC then assisted South Birmingham College in its wind turbine project at the new College for the Construction Trades, and is now embarking on a series of presentations to community and after-school groups on energy conservation and renewables, from which it will use the feedback to develop real energy projects.

All of the models of ownership detailed, community based or not, would benefit from a clearer legal structure and a greater up-take of micro generation technology, to facilitate economies of scale. The model of Community Energy Company offers the greatest range of social benefits, having significant potential to revolutionise people's relationship to energy consumption and allowing for provision of advice and support for the use of any 'plug-and-play' devices, while also dispersing some of the profits from energy generation to rural and disadvantaged communities. Where local conditions permit, and where economically viable, this should be the first form of ownership considered for DE projects.

As discussed elsewhere in this study, the two CHP projects planned for Birmingham are being set up and managed by an ESCO owned by Utilicom Ltd, who bring expertise to the project and assist the council by sharing risk.

There is potential for incorporating community ownership elements into the ESCO model, and there may be precedents to investigate of tenant-driven CHP ESCOs in residential areas of Manchester. Incorporating community ownership elements into

¹⁰ R. Sauter, J. Watson, B. Bahaj, P.A. James, L. Myers, R. Wing (2006), *Unlocking the Powerhouse: Policy and System Change for Domestic Micro-Generation in the U.K.*, collaboration between the Universities of Sussex, Southampton and Imperial College, London.

ESCOs should always be considered for areas where there is a large amount of housing stock, and particularly high-rise stock. There is more European funding readily available for residential schemes with social benefits.

Using Local Authority bonds to help tackle climate change.

Substantial up-front investment is vital to shift the UK's centralised, fossil fuelled energy system towards one that is decentralised.

Research by LWM's Colin Hines and Richard Murphy, a financial institutions expert, has shown that pension funds, banks, insurance companies and the public are looking for safe investments, and would invest more in energy efficiency were it easier to do so. To an extent this could also generate a sense of community control and responsibility for local schemes.

The US uses its trillion dollar municipal bond market and the rest of Europe its local authorities bonds for such funds. Since the Thatcher government, UK local authority bonds have been blocked as part of measures to further centralise economic control.

However in November 2004 the Greater London Authority was allowed by the Treasury to raise a £2.3bn bond issue to improve London's transport. A similar approach could be taken by Birmingham to fund for example future CHP projects. The concept of a 'Brummie Bond' has already been raised by LWM with councillors and Urban Design and had a favourable response.

Conclusions:

Community ownership models make a significant contribution to the effectiveness and benefits of DE systems, and further research on the following would be usefully incorporated into a DE feasibility study for Birmingham:

- The financial and other viability of particular locations, the interest and skills of local communities, and the ability of schemes to attract renewables obligation certificates
- The feasibility of locally issued bonds as a funding mechanism
- The viability of combining some elements of local ownership with the existing ESCO/CHP proposals for Birmingham
- A potential role for the new Climate Change Agency in working on integrating community ownership models to get maximum benefits from DE.

Annex 1 – Consultant’s Terms of Reference

It is envisaged that the Consultants will prepare a five part report.

Executive Summary
Part 1 – DE scenarios in Birmingham
Part 2 – Socio-economic considerations
Part 3 – Conclusions
Annexes

It is essential that the report can be approached by non technical readers with methodologies, assumptions and technical content presented in sufficient detail to satisfy technical practitioners.

Part 1 – DE scenarios in Birmingham

The consultants will be expected to:

- A. Establish a baseline for heat and electricity demand (along with associated CO₂ for all buildings (domestic, non-domestic and municipal) for the baseline year of 2005.
- B. The consultants will construct a corresponding demand profile for 2025.
- C. The 2025 demand should then be balanced against the following energy supply scenarios and the primary energy and resulting CO₂ emissions calculated. The six scenarios are:
 - i Low nuclear – where existing nuclear power stations are closed at the end of their lifespan being replaced with gas-fired.
 - ii High nuclear – a total of 4.8GW of new nuclear power by 2005.
 - iii Low DE – low nuclear – where as in scenario i), nuclear power stations are closed and CHP plant combined with CH networks are developed in the city.
 - iv High DE – as iii) plus the use micro CHP and domestic scale renewable energy.
 - v Low DE - some nuclear build – ii) combined with iii).
 - vi High DE - some nuclear build – ii) combined with iv).
- D. Consultants are able to propose methodologies that vary from those suggested in these terms of reference; however the rationale and value of alternative methods should be carefully assessed.
- E. It is suggested that the successful consultants convene a workshop with key individuals and stakeholders from Birmingham and the West Midlands Government Office region in order to inform and enhance the methodology and scope of the study.
- F. A commissioning group of key individuals within the city and involved in existing projects should be formed to oversee the detailed agreement of a methodology.

- G. Assumptions made in the study should be consistent with the realities of the technological limitations; Birmingham's building stock (planned new build, regeneration, demolition, density) and current statements from Government on energy policy.
- H. Assumptions should also include a review of any existing district heating infrastructure, be it in use or obsolete, as well as the replacement of combined heat and power/ distributed energy systems in the city's existing infrastructure.
- I. Assumptions made in calculating the energy demands in both 2005 and 2025 should be detailed for the domestic and non domestic sectors.
- J. Assumptions made in determining future supply – both centralised and DE - should be detailed along with the models that are to be used.
- K. Assumptions will also need to be made in order to determine energy and fuel balances for the supply scenarios detailed above.

Part 2 – Macro environmental considerations

- A. A macro environmental review should be undertaken, cross referenced to Part A, exploring the economic, social, political and legal (legislative) factors that are likely to influence the DE scenarios described in the study.
- B. In their proposals the consultants should explore the areas that they believe may be critical in achieving a high DE scenario and their determination in Birmingham, the city-region, regionally in the West Midlands, nationally in Westminster and internationally.
- C. There are a number of activities taking place, and centres in development, from City to regional level which will have a significant impact on decentralising Birmingham's energy supplies and developing the market and supply chains for renewable and low carbon energy sources. The methodology and scenarios adopted for use in the study should take these into account. Details of activities and centres available at the time of writing are summarised below.
- D. Contributions come from the City Council's Urban Design department, individuals involved in the Core Cities and Birmingham City-region and other local or regional contacts. A list of key contacts is provided in Appendix 3.
- E. A regional centre for hydrogen fuel cell research was formally launched at the University of Birmingham in December 2006. Whilst fuel cell technology is still in its early stages of development as an alternative source of fuel, Birmingham will be well placed to be an early adopter as part of its long term proposals for a decentralized energy network.
- F. Other centres in development are proposals by Climate Change Solutions and the University of Warwick for a regional Climate Change Centre, and a joint bid by the East and West Midlands for the setting up of an environmental technology institute throughout the consortia of key research institutions across the Midlands region. Climate Change Solutions alongside the key regional agencies (Advantage West Midlands, Energy West Midlands and the University of Birmingham) will also host a regional DE seminar in February 2007.
- G. The Birmingham Strategic Partnership is in the process of developing an inter-agency Climate Change Strategy for the City. The BSP also propose to set up a Climate Change Agency in order to oversee activities of partners and ensure targets identified within the final strategy are delivered. At the time of writing,

proposals for a feasibility study into a viable structure for this Agency have been submitted to the council for consideration. A response is expected early 2007.

- H. Birmingham has recently agreed its preferred supplier, Utilicom, for managing a city-wide Energy Services Company (ESCO). The ESCO will initially be responsible for managing two large scale combined heat and power projects in the Eastside regeneration area of Birmingham and on Broad Street. It is anticipated that both projects and plants will be up and running in February 2007. The Climate Change Agency will have overall responsibility for the ESCO and also act as the main conduit for all mitigation and adaptation activities across the city.
- I. Birmingham is one of six Government-nominated Science Cities¹¹, a programme designed to develop region-wide strategies to exploit centres of world class scientific research to the benefit of both businesses and individuals. Birmingham's aspiration is to use its individual strengths in energy and environmental technology (for example fuel cells, biogas from waste, energy efficiency, large wind turbines), to create a low carbon city¹².
- J. Urban Design at Birmingham City Council is formulating a report on the potential role of, and opportunities for, bioenergy across the city. A biodiesel working group has recently been convened to develop an action framework for the council and the city's Waste Management team are revising their strategy and considering the potential for a long term extension to the energy from waste contract at Tyseley. Links between combined heat and power and bioenergy are being considered, as are the development of supply chains for low carbon fuels from across the region.
- K. In light of the significant research and development taking, or soon to take place, within the city, Part 2 of the report should explore the potential contribution of both the established and more newly emerging renewable and low-carbon technologies. This approach is advocated by the Council's Urban Design department.
- L. Viability and potential contribution of the less well established or newly emerging technologies will be significantly more long term, therefore we propose that two sections of Part B consider firstly,
- The contribution of 'proven' technologies (CHP, wind, solar etc) to decentralising Birmingham's energy requirements by 2020. This should include an assessment of heat demand and analysis of available data for each of these potential technologies.
 - Secondly – a long term macro environmental review of the potential contribution of emerging energy and fuel sources being researched within Birmingham or the West Midlands Government Office region, including hydrogen fuel cells, biomass, biofuels and bio-organic waste. The timescale should match the city-region's target to move towards a carbon neutral region by 2040.
- M. Changes in energy consumption and the viability of technologies will also be driven by the profile of users of such systems, particularly in the domestic

¹¹ Science Cities are defined as 'those with strong science based assets – such as a major university or centre of research excellence – which have particular potential to attract a critical mass of innovative businesses and become drivers of regional growth'.

¹² Birmingham Science City – ideas for life, May 2006

context. Consideration should be given within Part 2 to the impact that population demographics will have on energy infrastructure.

- N. Projections for the West Midlands estimate that by 2025, 27.5 per cent of the population will be over 60 years of age¹³. The long term sustainability of affordable fuel in both a heating and cooling context will therefore be of key relevance to a city-wide response. This approach is again suggested as a result of feedback from Urban Design.
- O. Finally, the City is exploring an education and training programme with key businesses and skills partners across Birmingham to help prepare for the anticipated upsurge in demand for expertise in the renewable energy markets. Decentralised energy technologies may have a significant role to play in the future supply of energy in Birmingham and the feasibility study should consider the skills and education requirements, and employment potential, associated with its widespread adoption.

Part 3 - Conclusions

1. The consultants will prepare conclusions deriving and cross linking from Parts 1 & 2

Annexes

It is envisaged that technical treatments and related assumptions and discussion will be included in detailed Annexes.

¹³ Office of National Statistics 2004 Subnational population projections

Annex 2 Potential data resources

Based on sources of data used by other Decentralised Energy feasibility studies, the Birmingham study may wish to consider sourcing the following information. An indication of the information's availability, cost effectiveness of access content is provided.

Data source	Availability	Cost effective to access?	Content
HM Government The Energy Challenge: Energy Review 2006	Available from DTI website	Yes – free to download	<ul style="list-style-type: none"> • Scenarios for future energy supply, energy saving, cleaner energy and energy security
Census 2001	Available from Census website	Yes – free to download	<ul style="list-style-type: none"> • Population and population demographics • Household and occupancy data • Employment data by sector • Physical environment e.g. land use, commercial & industrial floor space
DTI Energy Trends	Available from DTI website	Yes – free to download	Annual publication of energy consumption and carbon dioxide emission statistics by local authority area. Includes breakdown by sector and fuel type.
English Partnerships Various research publications	Available via English Partnerships website	Yes – available to download or order	<ul style="list-style-type: none"> • Employment densities report (guidance and a point of reference for practitioners in formulating predictions for

			<ul style="list-style-type: none"> employment densities) Utilities infrastructure report Surplus public sector land Housing statistics briefings
West Midlands Regional Observatory (WMRO)	Available from WMRO website	Yes – free to download	Data on energy demands, emissions and existing renewable energy supply (uses DTI Energy Trends data)
Regional Energy Strategy Monitoring Report			
Greater London Authority (GLA)	Available from GLA website	Yes – free to download	<ul style="list-style-type: none"> Detailed study of the potential for community heating in London. Useful reference for production of heat demand data
The London Community Heating Development Study – summary report			
Mayor of London & Greenpeace	Available from GLA website	Yes – free to download	<ul style="list-style-type: none"> Example decentralised energy feasibility study for London Useful reference for production of heat demand data (Appendix A)
Powering London into the 21 st Century			
Mayor of London	Available from GLA website	Yes – free to download	<ul style="list-style-type: none"> Methodology for identifying heat demand and suitable sites for community heating
The London Community Heating development study – summary report			
City of Edinburgh Council et al	Available from council website	Yes – free to download	<ul style="list-style-type: none"> Example decentralised energy feasibility study for Edinburgh
Powering Edinburgh into the 21 st century			

Hestia Managed Services Ltd.		Yes – available on request	<ul style="list-style-type: none"> • Energy efficiency improvements in the domestic sector • Potential for improvements • City fuel poverty profile • Manufacturers and installers of renewable energy technologies (local to national)
Birmingham Economy website www.birminghameconomy.org.uk	Available from website	Yes – free to download	<ul style="list-style-type: none"> • Various economic trends and forecasts on growth rates, employment and investment
Birmingham City Council Development Summary	Available from council website	Yes – free to download	<ul style="list-style-type: none"> • Observed development and trends in 2005-06 • Land for future development • Residential and non-residential
Birmingham City Council 2004 sub national population projections	Available from council website	Yes – free to download	<ul style="list-style-type: none"> • Population projections to 2028

The following documents and reports could also provide useful input into a full feasibility study:

Data source	Availability	Cost effective to access?	Application in DE study
Department for Trade & Industry (DTI)	Available from DTI website	Yes - free to download	Supporting documentation summarises Government aims and objectives for distributed electricity generation and CHP
A call for			

Data source	Availability	Cost effective to access?	Application in DE study
evidence for the review of barriers and incentives to distributed electricity generation, including combined heat and power, November 2006			
Energy Saving Trust Potential for Microgeneration, study and analysis, November 2005	Available from DTI website	Yes – free to download	Reference for the potential for microgeneration technologies by type, barriers to implementation and potential contribution to meeting co2 reduction targets.
Building Research Establishment The UK potential for community heating with combined heat and power	Available on the EST website	Yes – free to download	<ul style="list-style-type: none"> • Methodology for mapping heat demand estimates by postcode (whole of the UK) • Most cost effective community heating and CHP sites by postcode area • All building sectors assessed
Environmental Change Institute (ECI) 40% House report	Available from ECI website	Yes – free to download	Report demonstrates that the domestic sector can deliver on the four key principles of the 2003 Energy White Paper and achieve a transformation of the housing stock
Sustainability West Midlands (SWM) UKCIP report on The Potential Impact of Climate Change in the West Midlands	Available from SWM website		Priority areas for action to adapt to climate change locally

Data source	Availability	Cost effective to access?	Application in DE study
Government Office for the West Midlands (GO-WM)	Available from GO-WM website	Yes – free to download	Opportunities for wind energy in Birmingham, including identified sites
Wind Capacity Study			
Bioenergy West Midlands	Available from Bioenergy website	Yes – free to download	Marketing and purchasing strategies for biodiesel and rape seed
Biodiesel production plant feasibility report			
Bioenergy West Midlands	Available from Bioenergy website	Yes – free to download	Existing and proposed bioenergy installations and infrastructure in the West Midlands Region
West Midlands bioenergy audit			
Birmingham City Council	Available on the council website	Yes – available to download	Policies and proposals that will guide land use in Birmingham to 2011
Unitary Development Plan (UDP) 2005			
Birmingham City Council	Available on the council website	Yes – available to download	Three year project plan for the production of Local Development Documents (will replace the Birmingham UDP)
Local Development Scheme for Birmingham, July 2006			
Sustainable Eastside	Available on the Sustainable Eastside website	Yes – free to download	Comprehensive assessment of local wind resource including details about grid infrastructure, visual impact, public issues, safety and local environment and heritage
Wind power feasibility study			
Sustainable Eastside	Available on the Sustainable Eastside website	Yes – free to download	Comprehensive assessment of ground source heat potential including economic and environmental issues, geology and hydrogeology of the region, suitable sites and cases studies
Ground source heat feasibility			

Data source	Availability	Cost effective to access?	Application in DE study
study			suitable sites and cases studies
Sustainable Eastside Solar power feasibility study	Available on the Sustainable Eastside website	Yes – free to download	Comprehensive assessment of passive solar, solar thermal and photovoltaic potential including benefits, costs, maintenance and regulatory issues
Castle Vale Neighbourhood Management Partnership		Study has not yet been commissioned	
CHP Feasibility Study			
Ecotricity		Study has not yet been commissioned	
Wind farm feasibility study, Castle Vale			
St Luke's Residents Association		Study has not yet been commissioned	
CHP Feasibility Study			
Sustainable Development in East Birmingham & North Solihull		Studies have not yet been commissioned	
Renewable energy feasibility studies			
West Midlands New Economics Group	Available on the East Birmingham Community Energy Company Webpage	Yes – free to download	Provides analysis of how renewable energy technology could be applied to the existing housing stock in Small Heath and what scope there would be for starting local social enterprises to do the work
Research Report: Sustainable Housing in Small Heath			

Annex 3 Contacts

Birmingham

Name	Area of interest / expertise
Keith Budden, Birmingham Strategic Partnership – Sustainability Manager	Sustainability, climate change mitigation and adaptation (all sectors)
Gayle Scholes, Aktins (formerly Birmingham City Council – Urban Design)	Birmingham Energy Services company, Birmingham CHP, financial models, Birmingham Climate Change Agency
Bill Arnold, Birmingham City Council – Urban Design	Energy supply infrastructure, energy from waste, Birmingham CHP, biofuels, fuel cells
Sandy Taylor, Birmingham City Council – Regional European & International Division	Birmingham city-region programmes, including the Science City and carbon neutrality
David Ward, Birmingham City Council – Sustainability Team	Birmingham Core Cities programme, sustainability and planning
Martin Wiltshire, South Birmingham Primary Care Trust	Energy management across health authorities in Birmingham
East Birmingham Community Energy Company	New CEC formed to enact ideas in <i>Sustainable Housing in Small Heath</i> , WMNEG (see section 7)

West Midlands Region

Name	Area of interest / expertise
Andy Stevenson, Energy West Midlands	Regional energy projects (all sectors)
John Sharpe, Sustainability West Midlands	Regional sustainable development, climate change mitigation and adaptation (all sectors)
Ralph Hepworth, Advantage West Midlands – Buildings Technology Cluster	Regional development work, building and energy infrastructure, environmental technologies
Louise Clancy, Sustainability West Midlands – Regional Climate Change Coordinator	Regional climate change mitigation and adaptation (all sectors), including climate change action plan development
Tony McNally, Climate Change Solutions	Regional climate change activities, energy efficiency and decentralised energy
Professor Kevin Kendall, University of Birmingham	Regional hydrogen fuel cell research
Professor Richard Green, University of Birmingham	Regional energy research and decentralised energy
Charlotte Harper, Severn Trent Water	Energy from waste

Annex 4 Strategic links

Birmingham

Strategy	Relevance
Birmingham Climate Change Strategy, draft (to be launched 2007)	Will set out the priorities for the City in meeting carbon emission reduction targets, ensuring sustainable and affordable energy supplies and adapting to future climate change. Draft includes proposed planning conditions for the on site generation of energy in new developments
Birmingham Local Area Agreement, March 2005	Sets a citywide target of reducing household carbon dioxide emissions by 30% by 2010/11
Birmingham Unitary Development Plan (UDP), 2005	The Birmingham UDP contains policies and proposals that guide development and the use of land in Birmingham up to 2011. The UDP proposes a number of design principles on which new development should be based. These include design which reduces the impact of climate change and pollution and minimise the use of non-renewable energy sources. The use of renewable energy sources is actively encouraged.
Birmingham Affordable Warmth Strategy	Outlines the council's commitment to eradicating fuel poverty in all households by 2016 and the activities that will enable this target to be met, including the use of renewable energy to deliver affordable warmth to vulnerable households

West Midlands Region

Strategy	Relevance
Regional Energy Strategy, November 2004	Sets targets for increasing energy efficiency to reduce overall energy use, increasing the proportion of energy that comes from renewable sources, and exploiting the business opportunities in both energy efficiency and renewable energy for the benefit of the regional economy.
Regional Spatial Strategy, June 2004	The RSS provides a long term land use and transport planning framework for the region. Prudent use of natural resources are key elements in the strategy and policy QE3: creating a high quality built environment for all encourages the incorporation of sustainability measures such as energy and water efficiency, use of renewable energy.

Strategy	Relevance
Regional Sustainable Development Framework, July 2006	The Framework sets out sustainable development objectives for the region and a process for incorporating these objectives into policies, strategies and plans in the West Midlands. Objectives include increasing the proportion of energy generated from renewable and low carbon sources, including by micro-generation, CHP, district heating, and in transportation, and promoting/ supporting the development of new high value and low impact technologies, especially resource-efficient technologies and environmental technology initiatives
West Midlands Economic Strategy & Action Plan 2004-2010	Developing a diverse and dynamic business base is one of four key pillars to the Regional Economic Strategy. This includes working in partnership to developing the region's environmental economy and using opportunities related to skills available within region and technology transfer from existing sectors to tackle climate change and build the region's production of energy based technologies.
Regional Climate Change Action Plan (in development)	The Assembly has committed itself to develop a regional climate change action plan and ensure that climate change is adopted as a regional priority. Activities will include encouraging business organisations and politicians to integrate climate change as a risk based activity into their business plans and strategies.

National

Strategy	Relevance
The Energy Challenge, July 2006	The Government's Energy Review recognizes that generating energy near where it is used will potentially lower emissions, increase diversity of supply and in some cases, lower costs. The report includes commitments to look at the potential for distributed energy as a long-term alternative or supplement to the current system, and encourage the use of low carbon and distributed technologies by raising awareness and reducing barriers to their more widespread adoption.

Strategy	Relevance
DTI Microgeneration Strategy, March 2006	The objective of the Government's Microgeneration Strategy is to create conditions under which microgeneration becomes a realistic alternative or supplementary energy generation source for the householder, communities and for small businesses. This will include facilitating the installation of microgeneration equipment by clarifying the permitted development status of technologies and removing any unnecessary controls over them.
DCLG Strong and Prosperous Communities – the Local Government White Paper, October 2006	The aim of the White Paper is to give local people and local communities more influence and power to improve their lives. The paper includes a Government commitment to support the development of energy services companies in core cities.