

CITY COUNCIL – 13 SEPTEMBER 2010

REPORT OF THE PORTFOLIO HOLDER FOR ENVIRONMENT AND CLIMATE CHANGE

CITY ENERGY STRATEGY 2010-2020

1 SUMMARY

- 1.1 To present Nottingham's draft Energy Strategy (2010-2020). Please note that the Draft Energy Strategy will be circulated as an appendix to the report in CD format and is also available to download from the City Council's website. A hyperlink to the Strategy is provided in section 10 of this report. A paper reference copy has been placed in the Members Room and a hard copy is available for public inspection at the City Library and as a background paper to this report.

2 RECOMMENDATIONS

- 2.1 It is RECOMMENDED that Council approve the Energy Strategy (2010-2020).

3 REASONS FOR RECOMMENDATIONS (INCLUDING OUTCOMES OF CONSULTATION)

- 3.1 This draft Energy Strategy sets out a roadmap for delivering the stretching targets and objectives within the Nottingham Plan in respect of the amount of the city's energy that is generated from low or zero carbon sources.
- 3.2 As part of the development of this strategy, a group of technical experts have advised throughout and it has also been the subject of a Big Green Debate with input from environmentalists, experts and citizens from across Nottingham.

4 CONSULTATIONS

- 4.1 A range of partners have contributed towards the development of this strategy, including the Universities, Nottingham Energy Partnership, Nottingham Development Enterprise and other City stakeholders.

5 OTHER OPTIONS CONSIDERED IN MAKING RECOMMENDATIONS

- 5.1 The draft strategy has been subject to rigorous evaluation, supported by Ernst and Young.

6 BACKGROUND

- 6.1 The Nottingham Plan (Sustainable Community Strategy) sets the overall strategic direction and long-term vision for the economic, social and environmental wellbeing of Nottingham. A cross cutting priority of the plan is Green Nottingham - to move Nottingham into a lower carbon future, and to live within our environmental limits. Key headline targets included in the plan are to reduce the city's carbon emissions by 26% of 2005 levels by 2020; that 20% of energy used in the city will be produced within the Greater Nottingham area from renewable or low/zero carbon sources and to increase the re-use, recycling and composting of household waste to 50% by 2020.
- 6.2 This Energy Strategy effectively sets out how Nottingham will achieve the target surrounding energy and ensuring that 20% of the City's energy is from low/zero carbon sources.
- 6.3 It is understood that this draft Energy Strategy is a UK first and cements Nottingham's leadership around issues of waste, sustainability and energy.

6.4 STRATEGIC CONNECTIONS

6.4.1 Energy and Carbon

Some 19% of all of the City's CO₂ emissions are generated from domestic gas use and 16% from domestic electricity use. It is clear that sustainable household energy management is a key component of reducing the city's CO₂ emissions. Similarly, 28% of the city's emissions emanate from the commercial and industrial use of electricity and 13% from industrial and commercial use of gas.

- 6.4.2 Not only is this a significant factor in the city reducing its overall carbon footprint, it has social and competitive considerations given

that average domestic energy bills have risen by 80% between 2004 and 2008. Furthermore, energy bills are predicted to rise still further in response to both national investment programmes and world prices. Energy market modelling by Ofgem predicts energy prices to increase between 20% and 60% by 2020, based on today's prices.

6.4.3 The development of secure, stable and cost effective energy is a significant contributory factor in Nottingham's citizens' quality of life and future economic prosperity.

6.4.4 Energy and Waste

6.4.5 There is a strong connection between waste and energy and is why both the Energy Strategy and the draft Waste Strategy have been developed simultaneously. As fossil fuels become increasingly scarce, and as demand for renewable and stable energy sources increase, waste management assumes a new and much more significant role.

6.4.6 A consultation process is presently underway on Nottingham's draft waste strategy and will be presented to a future Council meeting.

6.4.7 Energy and Local Investment – Local Carbon Framework (LCF)

6.4.8 Nottingham is one of nine authorities to have been chosen by the Department of Communities and Local Government to pilot the Low Carbon Framework programme. The frameworks potentially cover a variety of initiatives, including renewable energy, waste and low carbon transport projects. The frameworks will promote new and more effective ways of meeting national ambitions on the essential climate change agenda.

6.4.9 Nottingham wishes to utilise its status as a pilot to progress this strategic repositioning of waste and energy, befitting Nottingham's acknowledged leading status around both of these agendas and to deliver decentralised low carbon energy for the City.

6.4.10 Energy and Jobs

6.4.11 It is also clear that significant economic opportunities face the City. Nottingham has two leading Universities and the Jubilee Campus at the University of Nottingham in particular, is an international

centre of excellence. The University of Nottingham is a leading research institution around issues of carbon capture and renewable energy technological developments.

6.4.12 The opportunities for Nottingham are not just in the higher education/ research sector but there are also wider economic benefits from the emerging green collar economy. This strategy has, as one of its primary drivers, green technology growth. The Council can use its influence as part of this strategy's execution to strategically support emerging energy markets, for example, around solar panels. There is real opportunity for Nottingham, cementing its status as the most energy self sufficient city, and building upon our national and international reputation through the Universities and previous initiatives such as the Nottingham Declaration, to take advantage of the economic opportunities that are emerging.

6.4.13 Energy and Strategic Partnerships

6.4.14 The scale of both the challenge and the opportunity is significant; however the role of the Council is likely to be centred around the role of city / community leader.

6.4.15 Government funding incentives for investment in renewables are principally based around a philosophy of incentivising investment in green energy technologies and solutions, financed through the increasing cost of fossil fuels. Recent funding streams that create this position and financial and environmental incentive include:

- Feed-in-tariffs
 - o A mechanism for selling 'excess energy' back to the grid at a favourable rate, meaning that localised energy generation can be profitable over the medium term.
- Renewable Obligation Certificates
 - o A mechanism that provides preferential electricity revenue rates for energy exported to the grid and generated by technologies falling under the Renewables Obligation Regulations. These include Anaerobic Digestion, Biomass facilities and Advanced Conversion Technologies.
- Renewable Heat Incentives

- A mechanism that provides a financial incentive on the sale of heat from renewable sources, for example through expansion of the District Heating network, where fuelled by a 'renewable' energy source.
- Local Carbon Frameworks
 - A system whereby energy companies are facing increasing taxes on fossil fuels and in order to avoid facing fines, they must invest in renewable technologies. In delivering these renewable solutions, the Utility Company is required to consult Local Authorities as part of the Local Carbon Framework (Nottingham is one of 9 Authorities piloting this nationally).
- Carbon Reduction Commitment
 - A cap and trade system for CO₂ emissions, with organisations (such as the city council) being fined for failing to adequately reduce CO₂ output and also 'sell' permits that aren't required.

6.4.16 In executing this strategy, the Council will need to broker a range of strategic alliances, not only with public sector bodies such as the Universities and the NHS, but with other organisations such as the Utility Companies and Waste Disposal Companies.

6.4.17 It is also clear that there will be an equal need to broker commercial arrangements with end users. The organisations most affected by increasing energy costs will be high energy consumers and it is sensible to situate renewable energy infrastructure alongside high energy users, or 'anchor energy users' in order to build the necessary commercial case for investment. This commercial imperative will seek to safeguard jobs and allow commercial organisations to effectively compete, whilst also providing stable income streams to offset the required investment in renewable energy infrastructure.

It is for this reason that a city-wide heat map is presently being researched, to allow a deep understanding of heat loads throughout the city. In addition, Nottingham Trent University is currently researching a 'Mini Stern Review for Nottingham', which will help to inform vulnerable businesses that may require enhanced support, as well as identifying green collar economic opportunities.

7 **THE DRAFT ENERGY STRATEGY (2010-2020)**

7.1.1 Starting from a position of Strength

7.1.2 Whilst the objectives and targets described in the Nottingham Plan and the broader energy challenges are undoubtedly stretching, befitting Nottingham's ambition, the city starts from an enviable position.

7.1.3 Between 2003 and 2007, Nottingham reduced domestic gas consumption by 16%; the greatest fall of any East Midlands' Local Authority and of all the Core Cities.

7.1.4 In 2006, Nottingham generated 2.93% of its own heat and power from renewable sources, including waste. This was largely due to the 'Energy from Waste' facility at the Eastcroft site, which is attached to England's largest municipal district heating network. This means that Nottingham is already England's most energy self-sufficient city, with the next best performing city being Coventry, which generated less than 1% of its own heat and power.

7.1.5 Nottingham generates a further 8.37% of its own heat and power from gas Combined Heat and Power (CHP) and the city hosts over 50% of the installed CHP capacity in the East Midlands.

7.1.6 These achievements place Nottingham in a leading position nationally. Nottingham is already the most energy self-sufficient city in England and the 8th most energy self sufficient local authority.

7.1.7 The city is therefore well placed – far better placed than most other cities – to respond to this challenge. Our natural advantages of hosting leading universities, the largest Municipal Energy Services Company (Enviro Energy), the Nottingham Energy Partnership, the Nottingham Declaration, along with a track record of innovation and delivery in this area gives Nottingham a natural advantage.

7.1.8 The draft Energy Strategy (2010-2020) has identified the key strategic objectives, delivery levers and numerical targets to deliver upon the objectives described above. The Action Plan details the priorities for action and investment, which have been assessed for their carbon, energy and financial performance.

7.1.9 City Energy Strategy

7.1.10 The draft energy strategy is built around the following themes:

- Energy Savings Programmes
- Energy Generation
- Green Technology Growth
- Planning and Policy
- Research and Development

7.2 **Energy Savings Programmes**

7.2.1 The strategy sets out an overall target of reducing energy consumption by 25% during the strategy's lifetime. The most preferable intervention is to reduce individual, business and personal energy consumption. This activity is split into three broad areas, namely

- Public Sector Energy Reduction
- Domestic Sector Energy Reduction
- Business Sector Energy Reduction

7.2.3 Public Sector Energy Reduction

The City Council and its public sector partners have clear leadership roles, as well as the financial and environmental imperative of reducing energy use. Key highlights within the draft strategy include:

- Carbon Reduction Commitment programmes – the City Council will plan and monitor its internal carbon reduction targets through a cross-organisation Climate Change Panel and will use Carbon Trust Advisors and external funds such as Salix to introduce energy saving projects throughout the organisation.
- Workplace Strategy – the City Council moving its headquarters to a much more energy efficient building in Loxley House, coupled with the neighbourhood segments of the workplace strategy, which will support the City Council's reduction in energy consumption. This will also maximise the use of Enviroenergy's heat and power, for example the electricity at Loxley House will be provided via

a private wire from Enviro Energy, as will the building's heating and cooling.

- It is not just the City Council that's showing leadership in this area, the City NHS energy consumption is also being reduced through a planned Carbon Reduction Programme.

7.2.4 Domestic Sector Energy Reduction

Nottingham's domestic sector presently accounts for 36% of the city's total energy use. Coupled with future price rises, this sector requires careful planning and coordination in order to meet the challenge of increasing households in fuel poverty, Whilst being aware of this challenge, it is also important to recognise that Nottingham has done particularly well in reducing gas use in the domestic sector in recent times with a 16% fall between 2003 and 2007. The most cost effective way of saving energy and carbon is through physical energy efficiency measures supported by behaviour change and education.

7.2.5 Highlights within the draft strategy include:

- Complete the cavity and loft insulation measures in all tenures through area based, community and targeted programmes (through the Nottingham Warm Zone Project utilising external funding).
- To work alongside Utility Companies in developing the Community Energy Savings Programme (CESP) to pilot solid wall insulation projects.
- To develop low interest loans, equity release schemes and 'Pay As You Save' models to enable investment in solid wall insulation and micro generation, following the publication of findings from the national pilots.
- Consider a significant growth in Micro generation by utilising new financing opportunities such as the Feed-in-Tariffs and Renewable Heat Incentives. This will be through a combination of supporting private investment in such schemes, as well as considering more ambitious corporate projects and schemes, in partnership with Nottingham City Homes. Such proposals have significant beneficial impact upon jobs as well as energy and environmental benefits.
- Provide comprehensive and coordinated information, advice

and guidance for householders, including funding opportunities and connecting customers to contractors.

7.2.6 Business Sector Energy Reduction

Rising energy prices potentially place Nottingham's businesses at a commercial and competitive disadvantage. Nottingham Trent University is currently undertaking a 'Mini Stern Review for Nottingham'. This review will identify vulnerable sectors and businesses that may require focused and tailored support; this research will also support areas of potential growth.

7.2.7 Specific actions drawn out of the draft strategy include:

- Establishing a City Business Energy Task Force, including the Universities
- Encourage and support a switch over to smart metering for gas and electricity amongst non-domestic energy users in the City
- Work with businesses to determine industrial or retail sites in the City that are suitable for localised, district or partnership energy solutions for biomass CHP
- Establish a business sustainable energy support service, providing information and advice around carbon management, renewable energy and energy saving opportunities to ensure Nottingham businesses are well placed in respect of energy security
- Promote micro generation – responding to Feed-in-Tariffs and Heat Incentives opportunities where appropriate.

7.3 **Energy Generation**

7.3.1 A great deal of the strategy is focused upon renewable energy generation. Whilst energy reduction is of course the uppermost priority, it isn't possible to realise our ambitions without investment in large scale, renewable technology installations and energy distribution infrastructure.

7.3.2 As part of the strategy's development, the various technologies

have been assessed and Ernst and Young have provided consultancy support to identify priorities for investment and action. The following technologies have been highlighted for progression.

7.3.3 Biomass and Combined Heat and Power

7.3.4 An initial feasibility study has been undertaken to establish a local supply of clean biomass and the most efficient route to processing this resource. All biomass has associated carbon emissions and costs related to transportation and processing, but locally sourced clean wood has the lowest carbon intensity.

7.3.5 Combining municipal, commercial and industrial waste streams presents an opportunity to develop a large biomass CHP plant; work carried out by Ernst and Young to establish the priorities for local investment in carbon reduction identified the development of a local biomass processing site and a biomass CHP plant as offering the most cost effective carbon savings of all the technologies evaluated.

7.3.6 Anaerobic Digestion (AD) Facility

7.3.7 The strategy also proposes the progression of an Anaerobic Digestion facility for the processing of organic waste.

7.3.8 The city generates around 30,000 tonnes of food and garden waste per annum, with approximately 17,000 tonnes being sourced from the municipal waste stream. It is proposed that this is used to fuel a city AD facility, generating up to 4.2GWh of biogas annually. This would provide the potential for a generation of 6.23GWh of renewable electricity and 9.72GWh renewable heat.

7.3.9 District Heating Expansion

7.3.10 District Heating offers the opportunity to provide low carbon heating and offers lower fuel bills to even more of Nottingham's households. Through Enviro Energy, the City Council already manages the country's largest district heating scheme, serving around 4,500 domestic properties throughout the city, as well as many of the larger commercial premises in and around the city centre.

7.3.11 The draft Energy Strategy (2010-2020) sets out a plan to double

the size of the city's district heating scheme and also extend the opportunities of delivering private wire electricity supplies as part of this arrangement.

7.3.12 The ongoing investment in the expansion of the district heating scheme to the Southside / Hub and Eastside Regeneration areas present real opportunity for expansion, and potentially connecting a further 6,300 properties to the scheme.

7.3.13 Hydro Power

7.3.14 The River Trent provides a significant site for hydro power within Nottingham. Beeston Weir is currently the only developed hydropower site within the city and at 1.68MW, is the largest hydro power station in the East Midlands. The remaining significant site is at Holme Pierrepont Sluice Gates. The development of this site is an identified action within the Energy Strategy.

7.3.15 Wind Power

7.3.16 The economics of wind power are dictated by average wind speeds, and the wind resource in Nottingham is limited. Preliminary work in the strategy has identified possible locations for three turbine sites situated along the wind corridor of the River Trent. These potential sites are:

- Grove Farm
- The Racecourse
- The Meadows Embankment

7.4 **Green Technology Growth**

7.4.1 The connection between this energy strategy and economic resilience is discussed below. The Council will seek to address this by connecting the opportunities provided by this draft Energy Strategy and national energy policy with support for emerging green industries. This will ensure that Nottingham benefits economically as well as environmentally. Headline actions include:

- Building upon the city's reputation for energy security, the Council will seek to establish an Energy Park to support new and relocating energy related businesses to base their operations here

- To develop a local GreenTech Industry Strategy to form a key element of the Nottingham Energy Strategy
- To support Nottingham's Science Park in attracting more SME and start-up businesses in the energy and low carbon sector
- To support the University of Nottingham in the development of an Energy research and test bed demonstration facility at the Jubilee Campus and link SMEs to this resource
- Investigate the issue of skills and provision in this field in relation to creating the right skill base across all levels of a future GreenTech Sector, including design, innovation, consultancy, manufacture and installation.
- Commission a Mini Stern Review for Nottingham to assess the economic impact of a changing climate and the changing economics of energy.

7.5 Policy and Planning

7.5.1 The strategy proposes that the Council will ensure that local planning policy supports the timely delivery of this draft energy strategy, through developing and setting rigorous and evidenced local targets for carbon and energy sustainability in new development. Specific highlights include:

- Through the Local Development Framework process, consult on the review of local planning policy in respect of renewables and energy efficiency, to deliver small scale renewable energy targets in the wider context of viable sustainable development objectives.
- To establish whether there is sufficient evidence to recommend higher targets in the LDF, within certain zones of the city, for example, encouraging the connection to district heating networks.
- To accelerate the Code for Sustainable Homes (CSH) and Building Regulations, on the road to zero carbon new build by 2016. The CSH level will be reviewed as Code Level requirements increase to 2016, and will be subject to value

for money tests and viability assessment through the statutory planning process.

- Through the joint Nottingham and Nottinghamshire Waste Core Strategy, identify and allocate appropriate sites for waste treatment infrastructure, including energy generating technologies.

7.6 Research and Development

7.6.1 Despite the research undertaken to develop this draft strategy, there remains a requirement for further research and development, particularly within an area of fast moving policy and technology areas. Key actions include:

- Conducting a city wide heat and cooling demand and source mapping exercise
- To determine the feasibility of running the city council fleet, utilising electric vehicles where appropriate and utilising Enviroenergy electricity. Some demonstration vehicles are already on trial.
- Work with Universities to evaluate new and emerging energy technologies, including the potential use of the river and canal as heat sources for Water Sourced Heat pumps

7.6.2 Transport

7.6.3 In 2006 transport represented 21% of the City's total energy consumption. Per capita energy use for transport across the City has fallen by 3.2% from 2005 to 2007.

7.6.4 Electricity will increasingly be required for vehicle use, especially in cities where most journeys are shorter and recharging infrastructure can be established to serve a high density of users.

7.6.5 The City district heating and power network is a potential link between the Energy Strategy and transport. The Enviroenergy private wire network has excess power at certain times and power that is currently sold back to the national grid. This power could be sold on for electric vehicle charging in the city, particularly to city council fleet vehicles. This will also be further explored as part of the review of local transport policies.

7.6.6 Furthermore, discussions have commenced to explore the connection of the Net2 tram extension to the Enviroenergy private wire electricity supply

7.7 **Delivery Considerations**

7.7.1 This draft strategy, coupled with the draft Municipal Waste Management Strategy, which is presently being consulted upon, represents a significant and transformational step-change in the city's approach towards sustainable energy management.

7.7.2 It is clear that to deliver this strategy over the next decade requires significant investment, investment that will exceed the Council's own financial resources. It will be necessary to utilise new financing opportunities as discussed in the body of this report, as well as creating strategic partnerships, to oversee the delivery of this strategy.

8 FINANCIAL IMPLICATIONS (INCLUDING VALUE FOR MONEY)

8.1 Beyond making informed choices about technologies and delivery partners, the greatest challenge remains the accessing of funding for major energy generation, supply chain and energy efficiency programmes.

8.2 This is recognised both locally and nationally and as part of the Low Carbon Framework Pilots, Nottingham is already working alongside central government (CLG) as one of the country's pioneering Local Authorities to explore how this challenge might be addressed.

8.3 There may well be a requirement for the Council to use its own resources to strategically lever in the external sums necessary to deliver this strategy. This will be considered as part of future budget deliberations and on the strength of individual business cases.

8.4 Government is already seeking to introduce initiatives to support strategies such as this and as described above, is seeking to fiscally encourage low carbon and renewable energy generation

projects and dissuade carbon based fuel sources, whilst recognising the inevitability that such fossil fuel sources will remain part of our overall energy solution for the foreseeable future.

9 RISK MANAGEMENT ISSUES (INCLUDING LEGAL IMPLICATIONS, CRIME AND DISORDER ACT IMPLICATIONS AND EQUALITY AND DIVERSITY IMPLICATIONS)

9.1 Creating partnerships and projects will involve inherent risks. Not only is the technology often unproven on the scale required, but the level of required investment is significant.

9.2 The Director of Legal and Democratic Services has allocated resource to support the development of the projects described above and to support the Council in managing and minimising inherent risks.

9.3 Similarly, the Director of Finance will support the individual project developments.

10 LIST OF BACKGROUND PAPERS OTHER THAN PUBLISHED WORKS OR THOSE DISCLOSING CONFIDENTIAL OR EXEMPT INFORMATION

10.1 Nottingham's Draft Energy Strategy (2010 -2020) which can be viewed online via the link below.
<http://open.nottinghamcity.gov.uk/comm/agenda.asp?CtteMeetID=3656>

11 PUBLISHED DOCUMENTS REFERRED TO IN COMPILING THIS REPORT

11.1 References listed in the draft strategy

COUNCILLOR KATRINA BULL

GLOSSARY OF TERMS

AD	Anaerobic Digestion
CESP	Community Energy Savings Programme
CHP	Combined Heat and Power
CLG	Communities and Local Government
CSH	Code for Sustainable Homes
LDF	Local Development Framework
SME	Small - Medium Enterprises