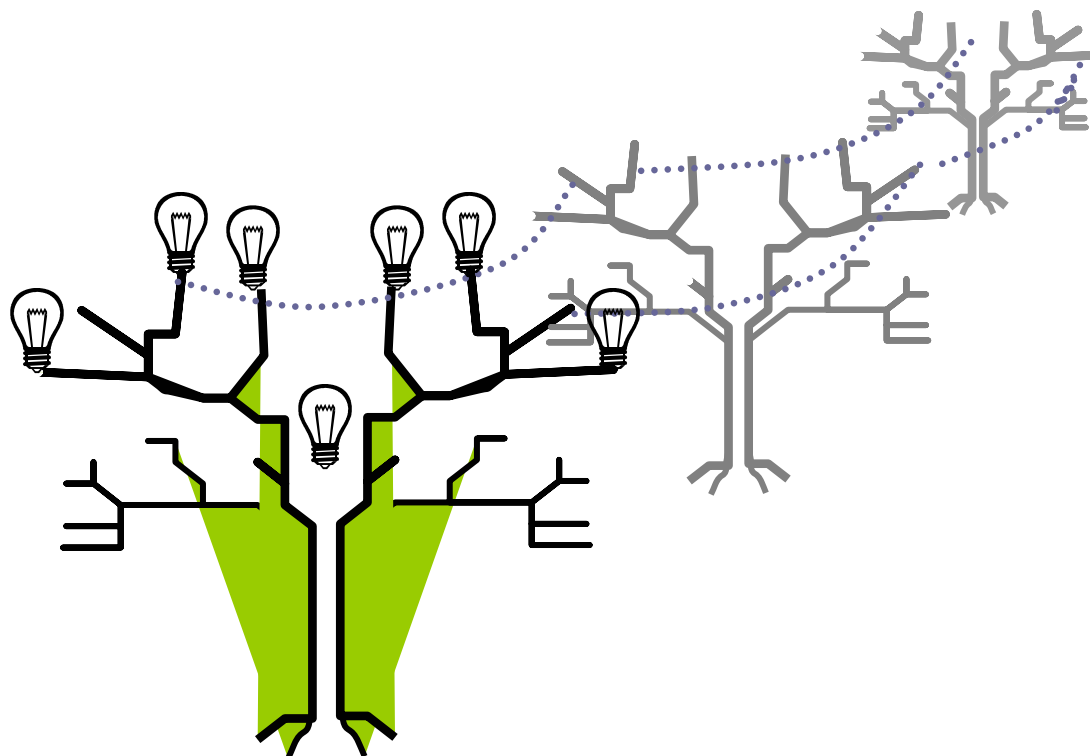


Sustainable Street Lighting Scrutiny Sub-Committee

Street Lighting - Strategic Management & Procurement to Reduce Carbon Dioxide (CO₂) Emissions and Waste.



Agreed at Sustainable Street Lighting Scrutiny Sub-Committee 21st June 2006

Considered by Scrutiny Management Committee June 2006

Agreed at Executive Date XXXXX

Chair's Foreword

Contents

Chair's Foreword	Pg.
Contents	Pg.
Summary of Recommendations	Pg.
Summary of Implications of Recommendations to the City of York Council	Pg.
Final Report	Pg.
Final Comments from the Board	Pg.
Board Members and Contact Details	Pg.
Glossary	Pg.
Annex A: Street Lighting Section of Regional Local Authority Cabinet Energy Champions Questionnaire	Pg.

Summary of Recommendations

- 1. Street Lighting Officers discuss and renegotiate the rate charged to the authority for lamp stock electricity supply to minimise financial costs and ensure that the contract to CYC includes upwards of 20% renewable sourcing to be increased towards a target of 100%.**
- 2. Street Lighting and Finance Officers ensure that the cashable and non-cashable energy and financial savings are reported in Gershon Efficiencies responses, ring fenced and invested in increasingly sustainable lamp stock.**
- 3. Street Lighting and Sustainability Officers ensure that CO₂ emissions from energy use in lamp stock are reported annually under EMAS and that targets are set for annual carbon savings.**
- 4. Street Lighting Officers should complete the audit and data base detailing lamp stock in line with best practice and the 'whole life' details outlined at paragraph 20 as a matter of urgency prior to renegotiating the electricity contract this year.**

5. Upon completion of Audit, Street Lighting Officers should prepare a lamp number reduction and replacement strategy for submission to the Executive
6. Street Lighting Officers should remain in contact with pilot authorities trialling PV lighting and endeavour to keep track of the best versions of this technology available.
7. Street Lighting Officers should consider the use of PV powered ‘stand alone’ systems or community netted systems installations for areas of the authority without grid netting requiring lighting. Officers should in this instance consider whole life costs of installation, including offsetting the installation costs against savings made from electricity billing during the systems life.
8. That the Elected Member Energy Champion present a first version of the Regional Assemblies questionnaire to the next Full Council and thereafter the Regional Assembly, as a record of the authorities position across all sectors to date.
9. That the Elected Member Energy Champion present six monthly updates of the Regional Assemblies questionnaire to Full Council and thereafter the Regional Assembly, as a record of the authorities progress on energy across all sectors.

Summary of Implications of Recommendations for City of York Council

Rec'd.	Implications		
	HR	Legal	Financial
1			
2			
3			
4			
5			
6			
7			
8			

Final Report: Street Lighting - Strategic Management & Procurement to Reduce CO2 Emissions and Waste.

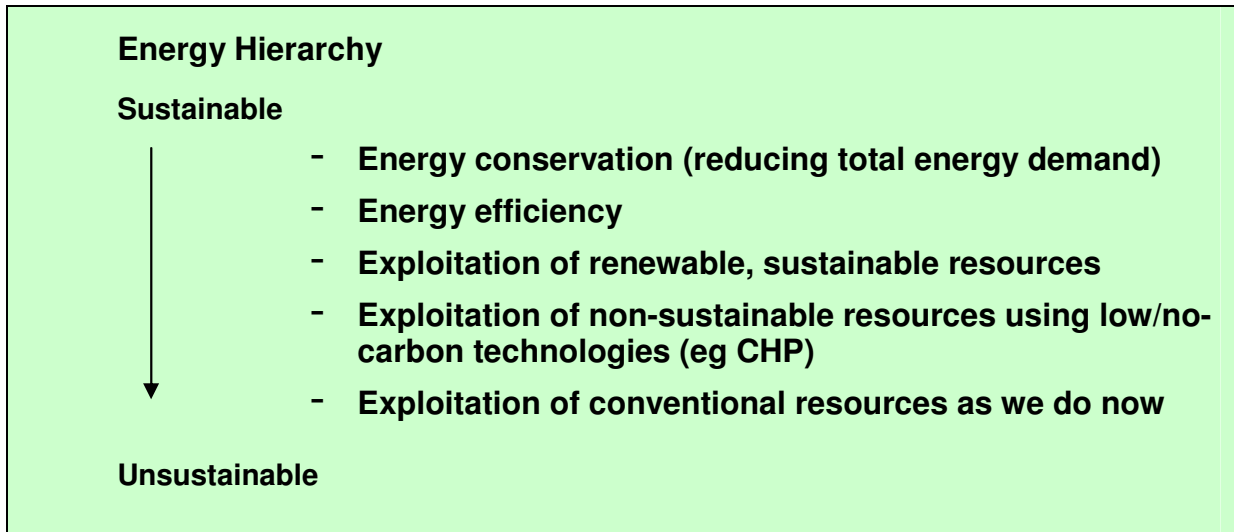
Summary

2. Members of the Executive are presented with the final report of the Sustainable Street Lighting Scrutiny Sub-Committee (formerly Environment & Sustainability Scrutiny Board) delivering their research and findings regarding approaches Local Authorities might take to delivering more sustainable street lighting.

Background

3. Between 2005-2006 Scrutiny¹ at The City of York Council advanced the development more robust and holistic strategic approaches to delivering carbon reduction and energy sourcing. These approaches have covered all sectors of the Council's work bar transportation fuel, including;
 - a. CO₂ reduction from domestic property: public and private
 - b. Sustainable planning guidance
 - c. Reducing managing and monitoring energy consumption in council property
 - d. Ensuring increasingly sustainable supply and embedded micro-generation in council property
4. The street lighting topic was considered by the Environment and Sustainability Scrutiny Board to be the next significant area for Scrutiny recommendations supporting the authority to monitor, manage and achieve carbon savings in line with;
 1. The Regional Energy Hierarchy (see box below)
 2. Future development of a Climate Change Strategy
 3. Recent changes to the National Planning Policy framework promoting greater sustainability
 4. The Audit Commissions aims for increased sustainable assessment in the Comprehensive Performance Assessment (CPA); for more information regarding Comprehensive Performance Assessment see glossary
 5. Gershon efficiencies reporting; for more information regarding Gershon efficiencies see glossary

¹ Through work of the Boards: Environment and Sustainability, Housing and, Planning and Transport



Cost And Emissions

5. When the Environment and Sustainability Scrutiny Board conducted their first scrutiny of Sustainable Energy in Council Buildings² annual energy consumption and emissions related to Street lighting (2004-05) were;

Street lighting: 9 million KWh consumed resulting in:
3,870 tonnes of Carbon Dioxide (0.43 kg CO₂ per KWh).
Annual cost £300,903 (average 3.34p per KWh)

6. The Authority's electricity bill for street lighting over the past year 2005-06 was approximately £750K, charged at 8.03p per unit. This figure (notable cost increase in part due to energy supplier price rises of around 35% across most sectors between 2003 and 2006³), compares very unfavourably with other areas of the council where the rates can be as little as 5.508p per unit.
7. On extrapolating the figures, the Board found 'suggested' financial savings in the order of £235K might be made by simply ensuring we get charged a better rate per unit. Officers advised that discussions are currently underway with the electricity supplier to renegotiate the deal CYC has with them.
8. In addressing costs the Board also considered equally environmental costs or impacts. At Wigan, a comparator authority, there are around 36,000 lamp posts and other street appliances requiring electricity. Wigan pays around £670K per annum for their energy supply, including a £14K surcharge for ensuring that all the power for its street lighting comes from wind power, a deal it has negotiated with Yorkshire Electricity and N-Power
9. York has around 20,000 lamp posts and other appliances around the city (almost half those of Wigan) and yet pays £750K (1K more per annum) to supply them with electricity that does not include any green sourcing.

² See Final Report of the Environment and Sustainability Scrutiny Board 'Sustainable Energy in Council Buildings Part 1: Energy Use, the City of York Council and Display'

³ The 4th Annual Report (March 2006) of the Government's Fuel Poverty Advisory Group (FPAG)

10. There is plainly huge potential to get a much better deal from our electricity supplier for all our street lighting, such a change including partial or full renewable energy sourcing would generate very substantial savings both in cost and carbon emissions.
11. Monitoring and reporting of year on year financial savings can be seen as being in keeping with Sir Peter Gershon's review of public sector efficiency. In particular, recommendations to further embed efficiency across the public sector whilst ensuring that identified efficiency gains "*...should not only improve efficiency but support local authorities to meet challenging new environmental targets.*"
12. Reported financial savings incorporated into the authorities annual Gershon responses, should be re-invested into planned improvements to existing and future lamp stock over short, medium and long term time scales. Creating a long term savings cycle befitting the target objectives of Gershon and reflecting best practice budget management.
13. Similarly, carbon savings achieved annually should be recorded using the authorities developing Environmental Management System (EMAS) to ensure a proper approach is taken to monitoring emissions and setting annual targets for reduction. At Wigan where all street lighting is powered by wind power on a 'green power' deal the authority has wiped 5.4 million kilos of CO₂ emissions from the borough's slate, it should be the aim of the City of York Council to do likewise.

Possible Recommendations:

- 1. Street Lighting Officers discuss and renegotiate the rate charged to the authority for lamp stock electricity supply to minimise financial costs and ensure that the contract to CYC includes upwards of 20% renewable sourcing to be increased towards a target of 100%.**
- 2. Street Lighting and Finance Officers ensure that the cashable and non-cashable energy and financial savings are reported in Gershon Efficiencies responses, ring fenced and invested in increasingly sustainable lamp stock.**
- 3. Street Lighting and Sustainability Officers ensure that CO₂ emissions from energy use in lamp stock are reported annually under EMAS and that targets are set for annual carbon savings.**

Installed Lampstock: Quality, Nature and Number

14. Until recently the authority had not compiled an accurate database detailing all of its lamp stock, work has been started to rectify this. The authorities known stock - 17568 street lights and approximately 2500 other lit units - covers a spectrum of gas discharge lamp types in its portfolio: from old mercury vapour lamps to low pressure sodium and high pressure sodium. There are also a few metal halide lamps. The differing kinds of lamps range in their energy efficiency and whole-life environmental performance.

15. Mercury Vapour Lamps are less energy efficient and therefore both environmentally and financially more costly. They are also poorer illuminators, the quality of street lighting is an important issue for people who feel vulnerable in the dark; particularly women, disabled people and elderly people. Hence any recommendations to alter lighting by type at an existing installation site must not reduce the quality or reliability of the lighting. Impact assessment for these communities / groups should be made prior to changes and in respect of compliance with equalities monitoring standards.
16. Removal of the old mercury vapour lamps as a starting point would bring both energy savings, and reduce recycling issues. Strategically planned replacement of the old mercury vapour lamps would also improve the authority's approach to social inclusion and equalities, as most of the mercury vapour stock is located in areas of deprivation.
17. Moving over to more efficient lamps has a further potential saving for the council. Newer more efficient lamps, such as metal halides, give more light with the potential for a greater radial spread per unit of energy. It is therefore possible to use fewer lamp posts.
18. Consideration should also be given to the height of lamp posts. Using higher columns, eg: 6 metre columns instead of 5 metre columns can have a significant impact in reducing the number of lamp posts needed by increasing the radial spread of the light produce per unit.
19. Many Local Authorities across the UK and Europe have now adopted long term lamp management plans which use increased unit efficiency to reduce the number of installed units by up to 40%. This approach creates even greater capacity for environmental and cost savings.
20. Moving from steel lamp posts and plastic fittings to aluminium lamp posts also improves the longevity of the equipment.
21. To assure future best practice at the authority the data base under construction should provide the following audit detail enabling whole life costings for each lamp by stock type, i.e;

Whole Life Auditing

- a. Lamp Life Expectancy
- b. Unit cost (financial)
- c. Unit cost environmental including expected energy usage per annum and extrapolated carbon emissions based on non-renewable sourcing
- d. Expected durability and maintenance requirements/costs
- e. Cost of installation including lamp posts, ballast, any necessary modification to the grid etc. as well as the lamps themselves
- f. Three R's⁴ recommendations for disposal of unit at end of life
- g. Known environmental disposal risks (i.e. soil contamination from parts if landfilled)
- h. Light out-put quality and range at differing post heights

⁴ Reduce, Recycle and Reuse

- i. Location of installation and distance between other installed units. are replaced, rather than refitting the lamp posts to take a different lamp it is worth also considering replacing the lamp posts.
22. Auditing and recording along these lines would provide the authority with the base line data required to;
 - a. Assess the cost of replacing all the remaining mercury vapour lamps to more efficient lamps, either sodium or metal halide.
 - b. Assess the potential for unit reduction and greater distance between installed units in replacement programmes
 - c. Assess within year financial savings generated from more efficient electricity usage with the potential of immediate transfer of funds to further improvements to stock
 - d. Assess the potential for carbon savings against increasingly stringent regional and national targets
23. Around 90% of the City of York Council's street lights use electronic control gear to switch lamps on and off, this is much more efficient than the old Cadmium Sulphide photo cells that used to be routinely used to switch lamps on and off. As a result, the authority has reduced hours of artificial illumination by an estimated, 30 minutes per day at 17,500 luminaires amounting to a reduction of over 3 million hours of illumination per year. Unfortunately the way we account to our energy supplier means that this improvement is not taken into account when calculating our bills.
24. The City of York Council's energy bills do not take into account how many lamp posts we have; in part due to the lack of thorough data held by the authority. The authority is currently being charged by the energy supplier based on the length of our road network rather than the number of lamps in the authority. Whilst this is not usual, it disadvantages the city and serves as a disincentive to progress on energy efficiency.
25. Presently we are also unable to submit data regarding the energy efficiency of the lamps fitted to the energy supplier, nor have they been appraised of the fact that the authority has installed energy efficient switching equipment.
26. The present patchy methodology for recording and assessing street lamp numbers and performance may well have resulted in the authority paying considerably more to the electricity company than we need to simply because we are not declaring what lamps we are using. Other Local Authorities have found that information gathered from an accurate audit of stock submitted to the energy supplier along with accurate information on kilo watt hours of energy usage can generate further savings of around 5%.

Possible Recommendations:

- | |
|--|
| <ol style="list-style-type: none">4. Street Lighting Officers should complete the audit and data base detailing lamp stock in line with best practice and the 'whole life' details outlined at paragraph 20 as a matter of urgency prior to renegotiating the electricity contract this year. |
|--|

5. Upon completion of Audit, Street Lighting Officers should prepare a lamp number reduction and replacement strategy for submission to the Executive.

Alternative Models

27. During the course of the Scrutiny Board Members also considered alternative street lighting models. Hull and Kirklees Metropolitan Borough Council (KMBC) now use a limited number of 'stand alone' solar electricity lamp installations. Those illustrated are part of a group of four Solar Street lights being trialled in KMBC's Newsome Ward.



28. The installations at Newsome have been well received by the neighbourhood as part of a broader PV and solar initiative. The installations have the benefit of light generation even during power cuts and the offsetting of installation costs against their useful life span. The lamps have suffered no vandalism which is often a matter of concern to authorities considering them. The lamps are a good means of providing illumination in non-grid netted areas.
29. The following disadvantages were also noted in considering this technology, the luminosity of the lamps is presently poorer than that of grid netted sodium or metal halide lighting, it should be noted however that industry is rapidly improving the quality of all forms of PV powering. Whilst installation costs will be paid back during the systems life initial investment is high.
30. The Board also considered studies from Energie Cités⁵ regarding strategies for large scale retroacted sustainability into street lighting schemes. The most effective European models use the auditing and reduction approaches detailed in this report combined with sourcing using community or district renewable sourcing networks. Community sourcing networks generally use locally situated wind turbines and/or photovoltaic arrays to provide power within a local grid area, this provides an advantage over stand alone PV installation as the lamp units may still be high luminosity sodium or metal halide.
31. Targets to generate quality (Combined Heat and Power) CHP by 2010 and expand or increase Community microgenerated grids – all sources - may pave the way for improved sustainable sourcing on street lighting in the UK. This will however be dependant on authorities taking a positive stance, using Planning Policy Statement 22 on Renewables etc, to requiring developers (particularly of medium to large scale sites) to show consideration for the broader community infrastructural requirements of their proposals in the brief. This may be an issue that authorities

⁵ the association of European local authorities for promotion of local sustainable energy policies. See <http://www.energie-cites.org/>

wish to consider as part of their Special Planning Guidance framework and explore further with Sustainability officers and planners.

Possible Recommendations:

- 6. Street Lighting Officers should remain in contact with pilot authorities trialling PV lighting and endeavour to keep track of the best versions of this technology available.**
- 7. Street Lighting Officers should consider the use of PV powered 'stand alone' systems or community netted systems installations for areas of the authority without grid netting requiring lighting. Officers should in this instance consider whole life costs of installation, including offsetting the installation costs against savings made from electricity billing during the systems life.**

Championing, Managing and Monitoring Continuous Improvement

32. During evidence gathering for the 'Street Lighting' topic Members requested that the Street lighting section of the Yorkshire and Humber Assembly Elected Member Energy Champions Questionnaire be completed; see Annex A. Scrutiny at the City of York Council was instrumental in supporting the Assembly's production of the questionnaire and fully supports the initiative which aims to engender a better understanding and application of best practice region wide.
33. The City of York Council appointed Cllr. Christian Vassie as its Elected Member Energy Champion at Full Council 25th May 2006. As a result of this Scrutiny the Board hope that the initial responses to the Street Lighting questionnaire will see significant improvement over the next year. In addition to recording possible financial savings through Gershon and CO₂ savings within EMAS it is proposed that updated versions of the full questionnaire be presented to the City of York Council Executive and Regional Assembly Energy on a six monthly basis to support monitoring of improvements.

Possible Recommendations:

- 8. That as a matter of urgency the Elected Member Energy Champion present a first version of the Regional Assemblies questionnaire to the next Full Council and thereafter the Regional Assembly, as a record of the authorities position across all sectors to date.**
- 9. That the Elected Member Energy Champion present six monthly updates of the Regional Assemblies questionnaire to Full Council and thereafter the Regional Assembly, as a record of the authorities progress on energy across all sectors.**

Final Comments from the Board

The Environment and Sustainability Scrutiny Board would like to acknowledge the assistance of a number of people for their technical support and advice to the Board throughout various points of the Scrutiny. The Board extends its thanks to each of those listed below.

Kristina Peat	Sustainability Officer, CYC
Ricky Watson	Street Lighting Engineer, CYC
Julian Horsler	Equalities Officer, CYC
Andrew Cooper	Yorkshire and Humber Assembly Policy Manager Energy

Contact details:

Authors:

The Environment and Sustainability Scrutiny Board

Supporting Scrutiny Officer to the Board:

Ruth Sherratt

Tel: 01904 552066

E-mail: r.sherratt@york.gov.uk

For further information please contact the supporting scrutiny officer in the first instance

Members of the Environment and Sustainability Scrutiny Ad-Hoc Panel 2005-May 2006

Chair	Cllr. Martin Lancelott
Vice Chair	Cllr. Brian Watson
	Cllr. Andrew D'Agorne
	Cllr. Richard Moore
	Cllr. Ruth Potter
	Cllr. Christian Vassie
	Cllr. Mark Waudby
	Cllr. David Horton

Other Members involved in progressing the topic 2004

Background Papers & Publications

Title and Author(s)
CPA 2005 Key Lines of Enquiry for Corporate Assessment (KLOE).

Publisher and Date
Audit Commission
Sept 2005

Environment and Sustainability Scrutiny Board -
Energy Use In Council Buildings

CYC Executive 2nd Feb
2005

Title and Author(s)	Publisher and Date
Environment and Sustainability Scrutiny Board - Generating the Future Draft Environmental Policy And Update On Preliminary Review For The Environmental Management System (Ems).	January 2006 CYC Environment & Sustainability EMAP 20th April 2004 ODPM May 2005
Feedback on the Consultation Exercise for the Best Value Performance Indicators for 2005/2006	ODPM May 2005
Review of Sustainable Energy - Beacons sustainable energy theme Local Quality of Life Indicators – Supporting Local Communities to Become Sustainable	June 2005 I&DeA Learning Pages ODPM, LGA, DEFRA, AC August 2005
Planning for Renewable Energy A Companion Guide to PPS22	ODPM 2004
Planning Policy Statement 22: Renewable Energy	ODPM 2004
Releasing resources to the front line Independent Review of Public Sector Efficiency Sir Peter Gershon, CBE	Crown Copyright July 2004

GLOSSARY

CPA	<p>The Audit Commissions ‘CPA 2005 Key Lines of Enquiry for Corporate Assessment’⁶ and ‘Technical Guide to the Service Assessment Framework (CPA 2005)’ were published September 2005.</p> <p>Audit’s stated aim in respect of Sustainability, Environmental Management and Energy presents a more robust CPA framework; <i>..to cover a more substantial area of the council's environmental service function andtake a broader view of the council's environmental performance"</i></p> <p>Under the Key Lines of Enquiry for assessing Local Authority performance against 5 themes, Local Authorities are obliged to provide evidence of the delivery against sub-themes or priorities agreed by the ODPM’s Central and Local Government Partnership.</p> <p>Theme 5.1 Sustainable Communities and Transport has particular bearing upon the work related to sustainable energy and energy efficiency. Criteria for judgement at Level’s 2 and 3 of 5.1.3 relating to an authorities internal policy and monitoring framework and the Planning Authority role. Sub Theme 5.1.3 and associated criteria for judgement is copied below.</p> <p>5.1.3 What has the council, with its partners, achieved in its ambitions for the local environment</p>
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⁶ September 2005 and October 2005

	<p>Evidence that</p> <ul style="list-style-type: none"> • the council, working in partnership with others, has established and is delivering on its clean and green liveability agenda • the council, working in partnership with others, has contributed to ensuring environmentally sustainable communities and lifestyles <p>Criteria for Judgement:</p> <p>Level 2:</p> <ul style="list-style-type: none"> • The council is addressing the quality of design in buildings and public spaces and is addressing these matters in its local development plans. There has been some increase in the proportion of new developments (for example, public buildings, housing, fixed infrastructure) which mitigate the effects of, or adapt to the impact of, climate change during planning, design and construction. • The council is setting a positive example to others through its environmental management practices <p>Level 3:</p> <ul style="list-style-type: none"> • The council has reduced its own resource consumption significantly and is able to quantify the cost of these and the environmental impact these policies have had. • The council is effectively addressing significant local and global environmental issues and actively communicating environmental issues to the wider community • Buildings and open spaces are designed to a high quality and this is addressed in the local development plans. There has been a sizeable increase in the proportion of new developments (for example, public buildings, housing, fixed infrastructure) which mitigate the effects of, or adapt to the impact of, climate change during planning, design and construction.
<p>Gershon Efficiencies:</p>	<ul style="list-style-type: none"> • In June 2004 Sir Peter Gershon's "<i>Independent Review of Public Sector Efficiencies</i>" identified opportunities for savings and improved time and resource management within the sector's back office, procurement, transaction service and policy-making function. A series of cross-cutting recommendations embedding efficiency across the public sector were created to release £6.45 billion nationally from efficiencies over the next 3 years. • Local Authorities are required to identify potential efficiencies annually they have been allowed to include efficiencies from 2004/05 within the 2005/06 target in recognition of the newness of the efficiencies concept to local government. Local authorities must produce an Annual Efficiency Statement (AES) for each financial year⁷. • At least half of the efficiency gains must be <i>cashable or recyclable</i>

⁷ City of York Council needs to identify £1.5 million of efficiencies a year for 2006/07 and 2007/08 to meet its target, as long as the £4.7 million is achieved in 2005/06.

	<p>i.e. direct financial saving or benefits creating funds for re-investment into services or activities increasing service output. <i>Non-cashable</i> gains may not necessarily lead to lower costs but will lead to improved performance for the resources used. All identified efficiencies must be on-going for the 3-year period; one-off gains are not allowable.</p> <p>. In respect of efficiencies relating to energy sourcing and management, the report is clear that identified efficiency gains “...<i>should not only improve efficiency but support local authorities to meet challenging new environmental targets.</i>”</p> <p>. In order to achieve these co-objectives the report also indicates that “..<i>effective strategy, evidence based policy and focused inspection and regulation are critical to driving up performance in public services</i>”</p> <p>. The Environment and Sustainability Scrutiny Board’s second sustainable energy report to the Executive – Generating the Future – recommended that <i>‘the City of York Council appoint an Elected Member as the Authority’s representative for the Regional Cabinet Energy Champions project and that this appointment and their activities be recorded and reported at meetings of the Council’.</i></p>
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Background Papers

Document

Sustainable Energy in Council Buildings Part 1: Energy Use, the City of York Council and Display'

'Sustainable Energy In Council Buildings Part 2: Generating the Future'.

Securing The Future - The UK Government Sustainable Development Strategy

Local Quality of Life Indicators – Supporting Local Communities to Become Sustainable

Feedback on the Consultation Exercise for the Best Value Performance Indicators for 2005/2006

CPA 2005 Key Lines of Enquiry for Corporate Assessment (KLOE).

Service Assessment Framework Technical Guide to CPA 2005

Releasing resources to the front line Independent Review of Public Sector Efficiency

Publisher

The Environment And Sustainability Scrutiny Board Oct 2005

The Environment And Sustainability Scrutiny Board January 2006

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ODPM, LGA, DEFRA, AC August 2005

May 2005

Audit Commission September 2005

Audit Commission October 2005