

<b>Committee(s):</b>	<b>Date(s):</b>
Strategy and Performance Summit Group Efficiency Board Efficiency and Performance Sub Committee	29 July 2014 27 August 2014 10 September 2014
<b>Subject:</b> City of London ENERGY EFFICIENCY FUND (CS/235/14)	<b>Public</b>
<b>Report of:</b> The Town Clerk and City Surveyor	<b>For Decision</b>

### **SUMMARY**

This report proposes the establishment of an Energy Efficiency Fund (EEF) which will enable the City of London Corporation to make energy efficient investments in its operational properties in order to reduce energy consumption and hence counter the impact of rising energy prices.

The EEF is a pilot scheme which will be reviewed formally after 2 years and the report provides a broad outline of concept. The EEF has the support of Summit Group but the finer detail of the scheme would be drawn up in consultation with service departments to provide clarity from the outset; including the full criteria, the expectations of each business case and how these would be judged.

The EEF would operate as a ring fenced fund and in the form of an internal, interest free loan which is recycled back into the EEF therefore becoming available again for reinvestment, hence creating a self-sustaining fund. Once the project loan has been repaid to the EEF, the project host department will continue to benefit from the ongoing energy savings.

The report details the parameters, eligibility and criteria for the EEF which would be managed by the City Surveyor's Department with financial support from the Chamberlain's Department and proposes an initial five year pilot programme followed by a review.

The proposed EEF would be capped at £0.5m a year and for an initial five year period commencing 2014/15, equating to a maximum commitment of £2.5m. The EEF would be split between City Fund, City's Cash and Bridge House Estates as appropriate to reflect the services to which the projects relate. The initial finance would be provided from the general reserves of the respective funds.

As the EEF would be replenished by repayments funded from energy savings, the total outstanding on the EEF will, consequently, be somewhat less than the implied £2.5m – an example of this is set out within the report. The actual outstanding balance at any point in time will depend on the number of projects, the value of projects and the repayment periods.

### **RECOMMENDATION**

Members are asked to:

- Support the establishment of an Energy Efficiency Fund, funded from general

reserves in accordance with the criteria laid out in this report;

- Agree that the progress of the fund and projects be reviewed annually with a formal review as to its future (fitness for purpose) after 2 years;
- Note that the Energy Manager will report on progress to the Summit Group and the Efficiency and Performance Sub-Committee.

## **Main Report**

### **Background**

1. In May 2013, the City of London commissioned external consultants to carry out a strategic review of the City's operational estate. The main driver for the review was to mitigate the projected increases in the City's energy costs over the next five years which are predicted to increase 34% by 2017/18, increasing energy expenditure from £15.1m (2013/14) to £20.2m in 2017/18.
2. The report resulting from the review detailed the cost and benefit of a range of potential technical and administrative improvements. Amongst the recommendations it contained were:
  - Financing options/mechanisms for implementing energy reduction measures;
  - Property prioritisation, and rationalisation and space planning;
  - Changes to operational procedures (in relation to repairs and maintenance, security, cleaning, out-of-hours working, etc.) and behavioural issues.
3. With respect to the first of these the report recommended the City of London establish an internal Energy Efficiency Fund (EEF) to act as a catalyst to deliver energy conservation projects that could be used to assist in funding the capital costs and enabling work that would be necessary to deliver the further and substantive energy reduction targets to meet the challenges of increasing energy costs.
4. The basis for establishing the EEF would be "spend to save" as the measures it would fund would typically pay for themselves in 3-8 years. It is considered that a programme of works totalling £0.5m a year would be manageable but should sufficient projects be identified consideration would be given to engaging additional resources should this be supported by a robust business case and all eligibility criteria is met.
5. The volatility and unpredictability of wholesale energy costs together with anticipated rises in mandated energy costs provides an imperative for such 'invest to save' opportunities. The principle focus of the EEF would be on buildings and opportunities that bring the maximum savings direct to the City itself through the City Fund, City's Cash or City Bridge Trust. The Strategic Energy Review highlighted a funding gap for such investment opportunities. The aim of EEF is therefore to plug that funding gap. As energy costs rise the incentive for departments is to limit long term price rises and meet internal energy reduction targets by investing in energy reduction measures sooner rather than later.
6. The EEF should not compete with, or be seen to be competing with the capital required for the Additional Works Programme.

## Criteria

7. The aim of the EEF is to increase capital investment in energy efficiency measures for the City, thus reducing energy costs in line with the objectives contained in the Strategic Energy Review. The EEF will be independent of the Building Repairs and Maintenance (BRM) and Additional Works Programme (AWP) budgets and projects that have been identified with an energy saving element under the BRM and AWP would continue to be funded through these routes. The EEF will not be used to divert, replace or subsidise other budgets.
8. The EEF will be managed through the City Surveyor's Department, with financial support from the Chamberlain's Department. This will allow the shortest organisational path between the key stakeholders who will all play a part in identifying energy reduction projects as well as approving and implementing them. These stakeholders include:
- The Energy Management Team;
  - Departmental Energy Wardens (departmental facilities representatives);
  - Departmental Energy Co-ordinators (senior departmental representatives with responsibility for energy);
  - BRM and Lift contractor;
  - The Projects and Operational Divisions of City Surveyors Department;
  - The Property Facilities Managers & Asset Managers; and Operational departments.
9. The EEF would be split between City Fund, City's Cash and Bridge House Estates as appropriate to reflect the services to which the projects relate. The initial finance would be provided from the general reserves of the respective funds. Funding would not be offered for projects where an alternative (external/third party) source of funds has been sought to support the project costs. The proposed EEF would be capped at £0.5m a year over the five year period. The EEF would be called upon to finance investment on a 'spend to save' basis where investment opportunities arise and where funding had not been identified.
10. As the EEF would be replenished by repayments funded from energy savings, the total outstanding on the EEF will, consequently, be somewhat less than the implied £2.5m. For illustrative purposes a simple example is set out in the following table.

	2014/15	2015/16	2016/17	2017/18	2018/19
	£000	£000	£000	£000	£000
EEF Balance b/f	0	500	900	1,200	1,400
Loans	500	500	500	500	500
Repayments	0	(100)	(200)	(300)	(400)
EEF Balance c/f	500	900	1,200	1,400	1,500

### Assumptions for Illustrative Purposes

Loans are made up to the full cap of £500,000 each year.

The loan repayment period for all loans is 5 years. In practice, the appropriate loan periods will be assessed for each project.

The first repayment starts the year after the works are complete.

11. The actual outstanding balance at any point in time will depend on the number of projects, the value of projects and the repayment periods.
12. A typical payback of approximately 3-5 years is anticipated to be the norm. In exceptional cases payback of up to 8 years would be considered, however it is anticipated that the number of projects with this payback period is likely to be low. Interest free loans would be paid back over an agreed period from existing revenue budgets. Payback would commence in the financial year following the commissioning of the works. In this way, departments would immediately see benefits from their investments in advance of commencing payback of the funds.
13. The EEF would be reviewed each year and would be set up to run for an initial period of 5 years, subject to formal review and assessment after two years, and at the end of the initial period. Officers would continue to explore and exploit external funding options such as from Government or the EU should these prove fiscally advantageous.
14. Straight payback would generally be used to shortlist projects but other assessments such as Net Present Value and Whole Life Costing<sup>1</sup> (including on-going maintenance) will also be considered where appropriate and to ensure full evaluation and consideration of projects that do not appear to be immediately viable.
15. It is proposed that the EEF is only used for projects that would not have otherwise happened or projects where additional funding is required to enhance specification of equipment being installed during more routine maintenance.
16. All departments with operational properties will be eligible to seek funds. Eligibility for funding will also be dependent on the completion of an appropriate Business Case Application, and the application of proven technologies (the EEF will not be available for experimental or speculative technologies).
17. Where the City Surveyor's Department identifies measures that meet all criteria these shall be prioritised and implemented as appropriate. Other suggestions would be a combination of client driven, operational needs and individual initiative based on maximising the efficiency of the property portfolio

### **Buildings in Scope**

18. The EEF would be open to all operational properties except the City's investment portfolio and residential estates. The EEF would be used to finance energy saving projects throughout the City's operational estate.
19. It is recommended that the initial main focus of any energy efficiency activities should be on the largest energy consuming sites and those with the greater return to the City of London; this would include Guildhall complex and the Barbican Centre. These two buildings together consume around 32% of the total energy for the operational estate and represent 51% of the total energy use to the City that cannot be recharged to tenants.

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<sup>1</sup> Net Present Value Net Present Value (NPV) is a formula used to determine the present value of an investment by the discounted sum of all cash flows received from the project. Whole Life Costing takes account of the cost of a product over its life, it includes the costs of maintaining and operating the product as well as its outright purchase together with the cost of consumables, utilities, training; and the cost of disposal at the end of its life.

20. Responsibility for energy reduction at the Guildhall complex would be with the City Surveyor rather than individual department heads resident within the Guildhall complex.

### **Types of work**

21. The EEF would be used for four key types of investment:

- measures identified as part of the Strategic Energy Review once robust investment payback assessments have been undertaken;
- measures identified by our BRM and Lifts contractor;
- the marginal cost increase of installing the most energy efficient equipment in cyclical replacements carried out as part of routine maintenance;
- ad hoc energy efficiency projects brought forward across the operational estate.

22. The Energy Efficiency Fund will assist the City in meeting its long term and publicly stated Climate Change Mitigation Strategy targets. That said, priority will be given to energy cost savings that lead to financial savings rather than pure CO<sub>2</sub> savings. All energy reduction will in turn reduce CO<sub>2</sub> emissions. Only proven technologies will be considered, the fund would not be used for experimental or test cases of equipment material or methods only. Funding would not be offered for projects where an alternative (external/third party) source of funds has been sought to support the project costs.

23. Improvement projects related to reducing water usage will also be allowable if the technology has an energy saving element, e.g. reducing the amount of hot water wasted.

24. The City's Energy Manager and Energy Team within the City Surveyor's department have a well-established network of officers throughout the City departments with varying responsibilities for energy and energy reduction and with whom they liaise regularly. Energy Wardens are departmental representatives at the 'coalface' who act as the 'eyes and ears' of the Energy Team. More senior departmental representation is provided by Energy Co-ordinators. Energy Co-ordinators are responsible for putting together Departmental Energy Action Plans that are revised annually and provide a local delivery plan for meeting departmental energy reductions. In turn departments are aided technically by the Energy Team and technical professionals within the City Surveyors team responsible for building repairs and maintenance and projects.

25. The EEF would provide positive benefit to both Energy Wardens and Energy Co-ordinators with funding opportunity in support of their identified short term and long term energy saving measures.

26. A comprehensive list of technology options suitable for implementation is included in the Appendices and would include;

- Boiler and controls and building energy management systems
- Computer, IT and office equipment solutions;
- Lighting types and control;
- Heating and cooling replacement, modifications and controls;
- Hot water distribution, provision and controls;
- Insulation, draught proofing and fabric improvements;
- Motor replacement and control systems;
- Ventilation and occupancy detection;

## **Process (method for applying)**

27. A comprehensive list of identified energy conservation measures (Appendix A) would provide a starting point for implementation for eligible sites through various stakeholders (see para 8). The EEF could be used to cover the marginal cost of enhancing routine maintenance such that more energy efficient options can be included under certain circumstances such as the provision of controls for lighting upgrades. (see Appendix A for details of potential project areas).
28. The City Surveyor's Energy Manager would oversee the fund management and project prioritisation with financial control provided by the Chamberlain. However energy conservation is a shared responsibility and the Energy Manager would look to draw on a broader 'church' of professions such as the Energy Wardens and Energy Co-ordinators, technical professionals and staff to identify potential projects. The EEF compliments a number of other projects arising from the Strategic Energy Review including revised targets and parallel organisational behaviour change programmes.
29. The minimum value for a project to be eligible would be £5k. However, encouragement would be given for smaller projects to be bundled together (providing they are the same technology) where possible to minimise the administrative burden. As this is a ring fenced fund any project with a value larger than £250k will be subject to approval, where appropriate, by Members in accordance with the Project Procedure. All applications would need to be accompanied with a business case using a compliance checking tool.
30. Proposals may be submitted for energy saving measures in new build or major refurbishment schemes, when funding is no longer available within the original budget. However, the Fund support will only be available where such measures were included in the original specification, but have since been cancelled and the proposals go beyond existing relevant buildings regulations. Supporting evidence will be required.
31. A simple loan agreement would then be drawn up between the Fund Manager (Energy Manager) and the loan recipient in advance of project implementation for all loans. This agreement must include a summary of the project details together with the agreed loan repayment schedule and would include a modest administration fee. The final decision making on a project 'go-ahead' will be determined by the City Surveyor's Department.
32. Investment cannot be made in projects that do not prove energy savings will be achieved. If an investment were to be made under an ongoing maintenance programme' legal requirement or wider building project the fund can only support the additional investment to select a higher energy saving option. Projects need to prove 'additionality' to mandatory or existing schemes.
33. The method for determining the payback period for projects is a simple calculation based on revenue savings. Where there is a known increase in energy unit cost due within the payback period, this increase can be factored into the revenue savings analysis. All associated costs should be factored-in when determining the payback period, e.g. capital costs, project management, forward maintenance and administration costs.
34. There must be a project file for each implemented project which contains as a minimum the following information:

- project proposal;
- project description and outline implementation proposals;
- derivation of expected energy, revenue and CO<sub>2</sub> savings;
- costing details such as contractor quotations or tender returns and subsequent tender analysis and reason for recommended quotation;
- feasibility study in appropriate situations; and
- signed internal loan agreement and repayment schedule.

35. For each project approved for funding, an internal loan agreement would be completed and signed off by an appropriate and authorised budget holder prior to the commencement of the project.

36. The loan repayment schedule should be agreed at the time the advance is agreed and repayments should be based on the forecast revenue savings of the project at that time. It is recommended that a common repayment date is established for all projects, with April and October being typical choices. This will simplify the Fund's performance, improve monitoring and reduce administration time.

37. As part of the project scrutiny and due diligence, mechanisms will be put in place to ensure that the EEF is not seen as an additional fund that project managers can draw on to cover overspends on existing projects. The Business Case Application would include:

- Client Details: Organisation; Project overview; Location; Date etc.
- Project Details: Background; Description of Works; Benefits; Type of technology
- Supporting documentation: Surveys undertaken; Quotations; Technical assessments
- Costs: Overall; Equipment; Installation; Operation and Maintenance; Other; Anticipated Return on Investment

38. The EEF would be used to finance energy efficiency and renewable energy projects that meet certain performance criteria on an invest-to-save basis. Once the project loan has been repaid to the EEF the project host will continue to benefit from the ongoing energy savings. As repayments are recycled back into the EEF they become available for reinvestment, hence creating a self-sustaining fund

### **Corporate and Strategic Implications**

39. The Carbon Descent Plan (CDP) 2009 is the first phase of the delivery mechanism to achieve the climate change mitigation strategy targets contained within the City's Climate Change Mitigation Strategy (CCMS). The CCMS set CO<sub>2</sub> emission reduction targets, in line with those adopted by the UK Government - 15% by 2015 and 34% by 2020 and 80% by 2050.

40. The CDP-15's focus is the reduction of energy resources which in turn will lead to offset savings in energy costs. The CDP-09 is therefore in accord with the second and third objectives of the City's Corporate Plan strategic aims:

- *To provide . . . **efficient** and high quality local service . . . with a view to delivering **sustainable** outcomes'; and*
- *To provide **valued** services to London.*

41. Reducing energy usage and carbon emissions allies with the City's core value:

- *The right services at the right price.*

42. In addition its primary focus is in keeping with Key Policy Priority 2 of the Corporate Plan

- *Maintaining the quality of our public services whilst reducing our expenditure and improving our efficiency;*

43. Investment to save energy will not only deliver financial savings but also associated carbon emission savings through payment of the Carbon Reduction Commitment allowance payment scheme.

## **Conclusion**

44. This report recommends the creation of an Energy Efficiency Fund as proposed in the Strategic Energy Review. The EEF will be used to target energy conservation projects in order to accelerate energy reductions and revenue savings. This in turn will support the targets contained within the City's Climate Change Mitigation Strategy.

45. Significant savings have already been achieved by the City and accelerating energy reduction measure investment through an 'invest to save' approach will bring further savings.

## **Appendices:**

Appendix A - Technology Options (Not exhaustive)

## **Background Papers:**

Report to Efficiency and Performance Sub Committee on 2<sup>nd</sup> July 2014: *Carbon Descent Plan 2009 – Year 5: End Year Energy Target Review 2013/2014*

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## **Appendix A – Technology Options (Not exhaustive)**

### **Boilers**

control systems  
replacement condensing  
replacement combination  
replacement modular  
burner management  
retrofit economiser

### **Building Energy Management Systems**

BEMS - bureau remotely managed  
BEMS - not remotely managed  
BEMS - remotely managed

### **Combined Heat & Power**

Gas, Diesel, gasoil engine CHP  
Biomass CHP  
Gas Turbine

### **Compressors**

Compressed Air: air compressor upgrade

### **Computers & IT solutions**

Network PC power management  
CRT to flat screen LCD  
Virtualisation  
Thin computers  
Uninterruptible Power Supplies  
Free Cooling for ICT  
Evaporative cooling for ICT  
Energy Efficient File Storage Replacement  
LED monitors instead of LCD (cost difference)  
CRT to LED monitors  
Hot aisle/cold aisle containment  
Multi-Functional Devices  
Energy Efficient Server Replacement

**Cooling** - plant replacement/upgrade

Free cooling

Replacement of air conditioning with evaporative cooling

### **Hand Dryers**

replacement to more efficient type

### **Energy from Waste**

Anaerobic digestion

Incineration

### **Heating**

Electric to Gas - heating using CHP

Electric to Gas - heating using condensing boilers

Electric to Gas - tumble driers

Heat recovery

Heating - direct fired system

Heating - discrete controls

Heating – distribution pipework improvements

Oil to Gas - boiler fuel switching

Replace steam calorifier with plate heat exchanger

Thermal Stores

Heating - TRVs

Heating - zone control valves

Steam trap replacements

**Hot water** - distribution improvements

point of use heaters

chlorine dioxide dosing and biocide treatment

### **Industrial kitchen equipment**

Steriliser to dishwasher replacement

### **Insulation**

building fabric

Cavity wall insulation

Dry wall lining

Loft insulation

Retrofit single glazing units

Roof insulation  
Secondary glazing

### **Draught proofing**

pipework insulation (internal)  
pipework insulation (external)  
Radiator reflective foil (external walls)  
Automatic/revolving doors  
Automatic speed doors  
Draught Lobby (internal)  
Draught Lobby (external)  
Air Curtains - heated  
Air Curtains - ambient

### **Laboratory Upgrades**

Diode pumped solid state lasers  
Fume Cupboards - VAV Controls + Inverter Drives  
Fume Cupboards - Auto Sash Closing + PIR  
Energy Efficient Fume Cupboards  
Heat Recovery on Extract System

### **Lighting controls**

discrete controls  
system centralised

### **Lighting upgrades**

Electronic ballast with dimming control  
Replace halogen with HID metal halide  
HP Sodium including new fitting  
Compact Fluorescent including changing the fitting  
Compact Fluorescent using same fitting  
Induction Fluorescent including changing the fitting  
T5 lighting including changing the fitting  
T5 lighting retrofit using adaptors  
T8 lighting including changing the fitting  
T8 lighting retrofit using adaptors  
T12/T8/T5 to CCFL including new fitting  
T12/T8/T5 to CCFL using same fitting

## **LED lighting**

Halogen to LED including changing the fitting

Halogen to LED using same fitting

Flood lighting to LED including changing the fitting

Compact Fluorescent to LED including new fitting

Compact Fluorescent to LED using same fitting

Incandescent to LED including new fitting

Incandescent to LED using same fitting

T12/T8 to LED including new fitting

T12/T8 to LED using same fitting

## **Street lighting**

Replace fitting, controls with electronic ballasts

Replace fitting with LED

Replace controls including electronic ballasts

Replace controls but not ballasts

Fit centralised controls with electronic ballasts

Fit centralised controls but not ballasts

Solar powered bollards

Non-illuminated bollards

## **Traffic lights**

Replace with LED including new fitting

Replace with LED using same fitting

## **Motor controls**

Fixed speed motor controls

Variable speed drives

Motors - flat belt drives

## **Motor replacement**

Motors - high efficiency

## **Office equipment**

Office equipment improvements for non-ICT

## **Renewable energy**

Biomass boilers

Heat Pump (Air Source)

### **Swimming pools**

Swimming pool covers - liquid

Swimming pool covers - manual

Swimming pool covers - motorised

### **Time switches**

Time control and switches

### **Transformers**

Low loss (cost difference)

Low loss

Low loss + voltage management (cost difference)

Low loss + voltage management

Transformer tapping change

### **Ventilation**

Ventilation - distribution

Fans - air handling unit

Fans - high efficiency

Ventilation - presence controls

High efficiency filters

Filter maintenance regimes

### **Voltage management**

Voltage management - fixed ratio

Voltage management - variable ratio

### **Occupancy**