

6 February 2007

PUBLIC LIGHTING RESPONSE TO GREENHOUSE ACTION PLAN

Division Statutory Services

Presenter Gordon Duncan, Principal Engineer Infrastructure

Purpose

1. To provide information requested by the Environment Committee in September 2006 on the potential role of a revolving energy fund or energy performance contract in delivering greenhouse reductions from public lighting and the response of Council's *Greenhouse Action Plan* with respect to public lighting.

Recommendation from Management

2. That the Environment Committee:
 - 2.1. acknowledge the initiatives being progressed with respect to installing more energy efficient lighting infrastructure in the municipality; and
 - 2.2. note the potential of a revolving energy fund or energy performance contract as mechanisms for funding of energy efficient lighting improvements.

Key Issues

Barriers to efficient public lighting

3. Public lighting assets can have an operating life of 20 or more years, and technologies are now emerging that are more energy efficient than those used in many of the City of Melbourne's street lights.
4. The City of Melbourne relies on its relationship with the electricity distributors in pursuing changes to public lighting as they own and maintain the majority of lighting assets. Electricity distributors are generally very conservative in their approach to new technologies. This is influenced by the financial and operational risks they carry in maintaining the lighting network.
5. The high capital costs of changing over the City's street lighting to more efficient technologies are also a significant barrier to updating the street lighting network. It is much more expensive to upgrade a spent lighting asset with a new technology than to change it over to a like fitting.

Potential instruments to finance upgrades and guarantee savings

6. Revolving energy funds and energy performance contracts are innovative instruments being used by some councils around Australia to achieve greenhouse reductions.

Revolving energy funds (“REFs”)

7. REFs operate as a strategy of investing in energy efficiency programs with any savings in electricity charges returned in a revolving manner to finance new projects. In effect, future energy savings pay for the cost of upgrades.
8. To be viable, projects need to generate both reliable energy efficiency gains and cash flow savings, enabling funds to be repaid within a reasonable period and with a minimum of risk. A framework is required to evaluate project bids, establish funding agreements to ensure savings are measured and returned to the fund.
9. Funds are generally established through seed funding. The level of funds is maintained by returning savings back into the fund. The alternative is to have less stringent requirements to pay back savings, while instead maintaining the REF with recurrent funding.
10. Councils operating REFs include Moreland City Council, and the City of Newcastle and Hornsby Shire Council in NSW. The REFs are typically used to fund Council asset retrofits, for example energy efficient internal lighting, and internal voltage reduction units. Savings for these types of retrofits can often be achieved very quickly. None of these councils have applied REFs to public lighting projects.
11. The general principle of an REF is being applied through the Sustainable Melbourne Fund. The proponents of an energy saving lighting technology known as the Active Reactor are currently developing a proposal for a trial of their device on a number of existing street lights in the CBD. Discussions are at a preliminary stage with the electricity distributor CitiPower and the Sustainable Melbourne Fund, to establish whether the fund can become involved in a trial and the extent of any potential support.

Energy performance contracts (“EPCs”)

12. EPCs are a mechanism to achieve energy savings with minimum cost and risk to councils or other organisations. Through an EPC, a contractor installs and maintains more energy efficient equipment, then guarantees a level of energy savings. This usually happens across a range of separate projects. In exchange, the contractor receives a fee over the length of the contract, which is generated by the energy savings. If the savings aren't achieved, the contractor will be financially penalised, and may be required to undertake retrofits to achieve the guaranteed level of performance.
13. The EPC may include the supply of up-front capital for projects, however, this is not a requirement as a preferred source of funds may exist elsewhere.
14. A thorough analysis is required to identify systems best able to deliver the energy savings, and in establishing a performance agreement that both parties are willing to abide by for a number of years. EPCs have a substantial administrative requirement, as well as the need to select projects with considerable energy and financial savings.
15. Advice is that Hornsby Shire Council has had success in introducing an EPC in 2002 where they have achieved an internal rate of return of 15% through projects such as air conditioning and internal lighting modifications. Hornsby has not applied the EPC to public lighting projects.

Prospects for public lighting projects

16. The capital costs of upgrading public lighting to more efficient fittings are very high relative to the financial savings. One factor limiting the financial benefits of energy efficiency is that approximately half of street lighting operating costs are directly linked to the amount of electricity used, the remainder being the costs of operating and maintaining the lighting assets.
17. One of the strongest cases for a public lighting retrofit lies in replacing the City's standard residential area 80 watt mercury vapour street lights with a new fitting known as a T5, which is a low wattage fluorescent lamp. T5s are already being successfully used in several City of Melbourne locations, and use approximately two thirds less energy. The estimated capital cost of the changeover is \$435 per light, delivering an estimated annual energy savings of 275 kilowatt hours and approximately \$20 per year in electricity and network charges. This is based on indicative pricing from City of Melbourne's main electricity distributor. It assumes the cost of maintaining the T5s is no higher than for mercury vapour lamps, however, it is understood that the longer lamp life of the T5 may eventually lead to further savings through lower maintenance costs.
18. At this stage it appears difficult to find the financial savings from public lighting projects so they can be successfully funded by an REF or EPC. These instruments will continue to be considered as capital and operating costs of newer technologies are reviewed.
19. The transition to new technologies will be made easier when the newer fittings are approved for widespread use, and supported by an agreed set of charges for electricity use and maintenance. Access to an agreed set of charges would mean Council is not exposed to the financial and operational risk of new technologies. This may remove the need for an EPC to guarantee performance. Current steps to progress this work are referred to in the Background section of the report.
20. REFs and EPCs will be investigated more fully as part of the forthcoming review of Council's Zero Net Emissions by 2020 Strategy, due by June 2007. It should be kept in mind that the introduction of new technology is already subjected to careful business analysis.

The current approach

21. The City of Melbourne has commenced discussions with electricity distributor CitiPower to negotiate a plan to replace the City's mercury vapour street lights with a more efficient lamp, possibly in conjunction with the normal lamp replacement program.
22. The types of mercury vapour lamps used in residential streets have several viable replacement technologies and are therefore a logical area to seek energy savings. T5, compact fluorescent and induction lights are all more efficient than the mercury vapour lamp, and less toxic to dispose of. It is hoped Council's process will benefit from work underway by electricity distributors, the Victorian Government and other organisations to approve these sorts of technologies for widespread use, and deliver an agreed set of charges.
23. It is estimated that a changeover of the City's approximately 2,000 lower wattage mercury vapour lamps to more efficient lamps could produce annual greenhouse savings of up to 550,000 kilowatt hours, representing approximately 500 tonnes of greenhouse gases (carbon dioxide equivalent) and approximately 4% of Council's electricity use in unmetered public lighting. Replacing the City's higher wattage mercury vapour lamps with metal halide lamps is expected to deliver a similar amount of energy savings.
24. If successfully negotiated, this changeover is likely to become the major focus of Council's capital works lighting program over the next 3-5 years, based on current levels of street lighting upgrade funding.

25. In recent years, the lighting program has focussed on funding lighting upgrades in the CBD, for example, to convert the major streets from sodium (yellow light) to white light using metal halide lamps for improved pedestrian amenity, comfort and safety, with some small energy savings achieved. Some of the replacement technologies referred to above are primarily for use in residential areas and are not appropriate for use in the major streets of the CBD, but are suitable for use in CBD lanes. It is not intended at this stage to move away from the use of metal halide lamps where they have already been installed.

Public lighting response to *Greenhouse Action Plan*

26. Council's *Greenhouse Action Plan 2006-2010* increases the target for greenhouse emissions from the public lighting sector from a 37 per cent reduction by 2007 to a 42 percent reduction by 2010. The reductions take reference from Council's base year of 1996/97.
27. The target is based on known infrastructure changes (not including Docklands) and the implementation of the actions within the *Sustainable Public Lighting Action Plan 2005-2010*.
28. The *Greenhouse Action Plan 2006-2010* sets out seven actions concerning public lighting. Most reflect actions and directions already contained in the *Sustainable Public Lighting Action Plan 2005-2010* and are currently underway.
29. The actions relating to public lighting in the *Greenhouse Action Plan 2006-2010* are to:
- 29.1. explore the potential role of a revolving energy fund or energy performance contract in delivering reductions;
 - 29.2. review and update Council's Lighting Strategy, to incorporate Council's commitments to greenhouse gas reductions, and the development of sustainable lighting technical guidelines;
 - 29.3. review energy use data in parks, and integrate data into Council's central energy data monitoring system (STARK);
 - 29.4. participate in the NAGA Streetlighting project;
 - 29.5. increase Green Power purchasing to 50 percent for all public lighting by 2010;
 - 29.6. explore the purchase of offsets credits for further greenhouse reductions by 2010, contingent on the trial with the buildings portfolio in 2006/07 being successful; and
 - 29.7. investigate the energy, greenhouse and financial impacts of the Docklands' public lighting infrastructure. Develop a Docklands Sustainable Public Lighting Action Plan, with greenhouse reduction targets, by 2010.

Time Frame

30. Council's *Greenhouse Action Plan* and *Sustainable Public Lighting Action Plan* set out an agenda for action up to 2010.

Relation to Council Policy

31. These plans support strategic objective four of the *Council Plan 2005-2009*, in particular the strategy of improving the energy efficiency of the Council's operations and reducing greenhouse gas emissions generated through its activities.

Government Relations

32. The City of Melbourne intends to gain from Victorian Government action on sustainable public lighting where practicable. For example, Council is participating in a project led by the Northern Alliance for Greenhouse Action which has been funded by the Victorian Government to address barriers to sustainable public lighting faced by the nine member councils.
33. Opportunities for government funding will be sought to assist in Council's plans to upgrade the public lighting network.

Finance

34. In 2006/07, \$1.145 million is budgeted for Council works on public lighting, including \$400,000 for street lighting upgrade and renewal. Much of these funds will be directed to new installations.
35. Public lighting accounts for a significant part of Council's operating expenditure, with \$2.414 million budgeted in 2006/07 in electricity, network and maintenance costs.

Legal

36. This report is for noting only and no direct legal implications arise from the recommendation made.

Sustainability

37. Public lighting accounts for more than half of Council's greenhouse gas emissions. The approaches set out in this report are therefore essential in delivering the savings sought by Council.

Background

38. The more efficient lighting technologies are not yet officially approved for use other than in limited trials. Agreement by electricity distributors and other stakeholders is required on the reliability, maintenance requirements and power use for new technologies in order to establish agreed charges, and approval for their widespread use.
 39. A group known as the Victorian Sustainable Public Lighting Action Group is currently assessing the technical feasibility of newer, more efficient public lighting technologies. The group represents Victorian electricity distributors, the Municipal Association of Victoria, Sustainability Victoria, and several other organisations. It is expected the group will produce its first set of outcomes by June 2007, including an agreed set of charges for T5 lights.
 40. Council adopted the *Greenhouse Action 2006-2010* in September 2006, and reset Council's operational target for greenhouse reductions to 50 per cent below 1996/97 levels. The target for the public lighting sector is a 42 per cent reduction.
 41. The *Sustainable Public Lighting Action Plan 2005-2010* was endorsed by the former Planning and Environment Committee in August 2005, and the *Sustainable Public Lighting Action Plan 2005-2010* will remain the instrument for achieving greenhouse savings from Council's public lighting activities.
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FINANCE ATTACHMENT

PUBLIC LIGHTING RESPONSE TO GREENHOUSE ACTION PLAN

Funding of \$1.145 million has been provided in 2006-2007 Council works budget for public lighting. The projects include:

- 06ES328G Street Lighting Upgrade and Renewal \$400,000
- 06ES306M Lighting Maintenance \$80,000
- 06PR024N Tan Track Lighting Upgrade \$250,000
- 05PR027R Parks Renewal Program
 - Royal Park Brens Oval Sports Lighting \$95,000
- 06PR013R Parks Renewal Program Works
 - Flagstaff Gardens New Lighting \$250,000
 - Royal Park Smith Oval Sports Lighting \$70,000.

Funding of \$2.414 million has also been provided in Council's 2006-2007 operating budget for electricity, network and maintenance costs in relation to public lighting.

Joe Groher
Manager Financial Services

LEGAL ATTACHMENT

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Section 3C(1) of the *Local Government Act 1989* (“the Act”) provides that the primary objective of a Council:

“is to endeavour to achieve the best outcomes for the local community having regard to the long term and cumulative effects of decisions.”

Section 3C(2) of the Act goes on to state that in seeking to achieve its primary objective, a Council must have regard to facilitating objectives, including —

“(a) to promote the social, economic and environmental viability and sustainability of the municipal district;”

Under section 3F of the Act, Council also has the power to do all things necessary and convenient to be done in connection with the achievement of its objectives and performance of its functions.

The recommendation in this report is therefore made in accordance with the Council's objectives and powers as set out in the Act.

Kim Wood
Manager Legal Services