



Cities for Climate Protection™
Australia: an ICLEI program
in collaboration with the AGO

Greenhouse reductions via hi-tech foreshore and park lighting

City of Port Phillip, Victoria

Issue: November 2001

Case Study

Synopsis

To reduce its public lighting bill, greenhouse gas emissions and light pollution on the City of Port Phillip's foreshore, the Port Phillip Council is using newly developed diode (DIO) technology to light the area at night. Showers International and the City of Port Phillip worked in partnership for four years to develop the lights. They reduce electricity consumption by up to 80 per cent and significantly reduce greenhouse gas emissions. As they provide directed lighting, light pollution is also reduced.

The city is a leading CCP™ council and is now at Milestone 5 of the CCP™ campaign.

Savings and Benefits

Financial Saving to Council: The City of Port Phillip's public lighting bill and maintenance costs will be reduced by more than \$36,000 annually.

Environmental Benefits: Port Phillip's CO₂e emissions will be reduced by approximately 110 tonnes CO₂e, or equivalent to over 49,000 litres of petrol annually. Light pollution will be reduced. Waste will be reduced because the lights have no mercury, which is contained in conventional light bulbs.

Social Benefits: DIO lights have a 'moonlight' effect and improve public safety as they do not create the shadows produced by conventional public lighting.

Other Benefits: Reduced maintenance costs and reduced risks to council staff, as the need to access the top of the light poles is minimal.

Cost to Council: Payback period of three and a half years.

Motivation to Develop New Lighting Technology

The City of Port Phillip was a founding member of the Cities for Climate Protection™ (CCP™) campaign.

The Local Action Plan expresses Council's strategic approach to reduce greenhouse gases. Part of this strategic plan was to reduce the council's public-lighting energy consumption, as this is the largest source of its greenhouse gas emissions.

The City of Port Phillip's Local Action Plan is consistent with its Corporate Plan which also embraces its commitment to building a sustainable environment.

Developing and installing a new lighting technology is the most recent action taken by the city which has already invested in energy efficient equipment and other measures that have reduced its energy consumption by 11 per cent

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and greenhouse gas emissions by almost 1,900 tonnes in 1999/00. The City of Port Phillip's popular foreshore, stretching from Port Melbourne to Elwood, has walking and cycling tracks and is dotted with piers and jetties as well as restaurants and cafes. At night, lights mounted on 290 poles light the area. With the new lighting technology greenhouse gas emissions from these lights are reduced, as well as energy costs, light spill and the community is provided with safer lighting.

'This is absolutely cutting edge lighting because it saves energy, greenhouse gas emissions, maintenance costs, and waste going to landfill. It also reduces light pollution experienced by many residents caused by lighting spill from conventional lighting.'

Councillor Julian Hill, Mayor,
City of Port Phillip.

'While the DIO light looks different it provides good, safe public lighting.'

About the project

Showers International and the City of Port Phillip formed a partnership and developed the DIO technology over four years. Council already had a long working relationship with Showers International through office lighting retrofits and other projects. The strong relationship assisted in the research and development (R&D) of the technology. Showers International is associated with Lumileds, which is a joint venture between Agilent Technologies and Philips which makes the DIO lights exclusively for Showers.

A key objective of the R&D was to be able to fit the DIO lights onto existing light poles and the City of Port Phillip's staff were very involved in the process. The council building maintenance officer's contribution was particularly important. He pointed out that installing the power adapter for the lights in the base of the light poles would remove the need to access the top of the light poles, reducing maintenance costs and risk to council staff.



DIO lighting on the St Kilda foreshore, highlighting the differences between conventional lighting and DIO lighting.

Costs and Benefits

The estimated greenhouse gas savings from the 290 lights is approximately 110 tonnes CO₂e or 46 barrels of oil or 75,516 kWh of electricity. Reduced energy bills and the need for maintenance is providing the city with a financial benefit of more than \$36,000 annually.

Before installing the DIO lights the 290 conventional 70 watt mercury vapour lights consumed over 100,000 kWh of electricity annually or 142 CO₂e tonnes. With the new lighting electricity consumption is estimated to fall to 22,800 kWh a year or 32 CO₂e tonnes. The CCP™ software was used to calculate these figures.

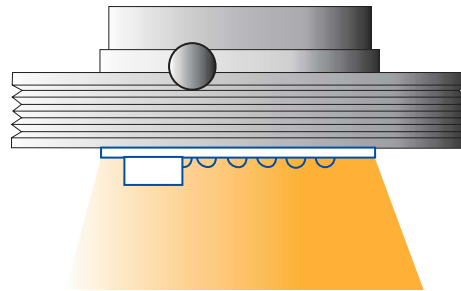
The negotiated price for a bulk purchase of DIO lights was \$350. The total cost of the lights was approximately \$100,000. This, plus the cost to install the lights, has a payback period of three and a half years.

The lights have a life of anywhere between a 100,000 to a million hours and it is anticipated that the DIO lights will not need to be changed for at least 20 years.

DIO lights are low voltage – 18V compared to the 240V used by conventional lighting – and the energy used by the DIO lights is up to 80 per cent less than that required by conventional lights operating at 18 watts.

DIO lights are impact and moisture resistant. As they produce less heat than conventional lights they are not so attractive to insects therefore reducing the contamination they cause and further reducing maintenance costs. Working conditions are improved and risks to council staff are significantly reduced for two reasons.

DIO Light - Stepped block shown



- Low voltage – 18 Volt DC
- More energy efficient than incandescent and most halogen lamps
- Long life
- Environmentally friendly
- 80% reduction in energy consumption
- Low maintenance
- Reduction of CO₂e emissions

- The power adapter for the DIO lights is at the base of the pole and all maintenance can occur at ground level.
- There is little need to access the tops of the poles as there is no need to replace light bulbs.

‘Port Phillip is proud to take on the leadership role in this amazing lighting technology that will revolutionise public lighting as we know it and pay for itself.’

Chief Executive Officer,
David Spokes,
City of Port Phillip.

‘DIO Lights are environmentally friendly, low voltage and reduce energy consumption by up to 80%.’

Longer term benefits

The City of Port Phillip is planning to retrofit light poles that it owns in other public open space areas, parks and gardens with DIO lights.

DIO public lighting has already attracted a huge amount of interest from councils and organisations from around Australia. It is anticipated that DIO lighting will be installed in many places around the country. The aggregated reduction in greenhouse gas emissions will be substantial.

'Being green does the right thing by the planet and the right thing by the ratepayers pockets.'

Councillor Julian Hill, Mayor, City of Port Phillip.

Issues and Lessons Learned

The City of Port Phillip's ten-year, local greenhouse action plan, *Greenhouse Reduction Strategy (2000)*, is the strategic document that underlies the city's commitment to implementing the project. The development of this document followed the city's adoption of its *Sustainable Development Strategy, 1996*.

The city's greenhouse initiatives and investments in new technology save it more than \$83,000 annually. However, the city's experience indicates that to successfully introduce new technology, it is crucial that all stakeholders understand the improvements and advantages it has over conventional approaches. For example, DIO lighting is direct with no spillage whereas conventional lighting can be up to 360 degrees resulting in light pollution. The difference in appearance and understanding the technology can take time to become accustomed to.

For further information about this project contact:

www.myshowers.com

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International Council for
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